Subsistence: A Guide For The Modern Hunter Gatherer

Hunting, Trapping, Fishing & Foraging For A Living in Central Texas

Nathan Martinez

preface by Robb Wolf

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Dedicated to my late best friends and greatest teachers: Clause, the supreme hunter, and Luko, the most faithful companion who spent every night with me in the woods under the stars

Contents

Foreword 9
Introduction 11
Resource Management & Prey Population Dynamics 13
Farming vs. Foraging 15
Why Forage? 16
Fierce Paradise: The Landscapes and Ancient Peoples of Central Texas ... 18
Environments 18
The Peoples 21
Subsistence Nutrition 24
Optimal Foraging Strategy 27
Specialized vs. Broad Spectrum Foraging 29
A Forager's Year (Calendar) 33
Estimated Expenses 34
Hunting & Trapping 36
General Hunting Regulations Relevant to Subsistence Activities: 36
Species 37
Arthropods, Reptiles and Rodents 48
Weapons 50
.22 Long Rifle—The Ultimate Subsistence Round 50
Slingshots, Blowguns, Airguns and Bows 53
Hunting Techniques 54
Stalking 54
Flushing & Driving 56

Still hunting 56
Trapping 58
Conibear 60
Foothold 66
Wire Snare 69
Deadfalls 74
Improvised Triggers 75
Dispatch 79
Diseases 80
Processing 86
Gutting & Skinning 86
Turning the Ears 93
Butchering 94
Drying 96
Grinding Meat & Making Sausage 96
Fleshing 98
Stretching and Drying 99
Tanning 101
Skull Cleaning 104
Fishing 106
Species 106
Commercial Fishing 115
Techniques 116
Cast Nets 116
Trotlines 119
Noodling 120

Traps....121
Spears....122
Gathering....123
Species....123
Tools....133
The Earth Oven....138
Pit Preparation....139
Plant Cooking....142
Meat Cooking....145
Public Foraging & Camping Lands....148
GLO....148
State Parks....149
City Parks....150
Roadsides....151
Navigable Streambeds....152
Dry washes, “Greenbelts” & Drainage Basins....153
Parking lots....155
Beach & Laguna Madre....155
Padre Island National Seashore....157
Wildlife Management Areas....158
Sam Houston National Forest WMA....159
Amistad NRA....160
Other (Army Corp of Engineers Lakes, National Wildlife Refuges)....162
Base Camp....163
Location....163
Shelter....164

Tents & Tarps 164
Rock Shelters 167
Modern Options 169
Water 169
Springs 170
Rainwater 170
Seep Wells 171
Solar Stills 172
Treatment 172
Basic Supplies 173
Heart of the Hunter 175
Bibliography 178
About the Author 180

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Foreword

By Robb Wolf

Author of *The Paleo Solution: The Original Human Diet*

August 30, 2012, Reno NV

Hi, my name is Robb Wolf. I'm a former research biochemist in the areas of cancer and autoimmunity research. I've written a New York Times best selling book (The Paleo Solution), was a California state power lifting champion and I've killed a 650 lb elk with a hand thrown spear (really). I'm 40 years old now and given that milestone I'm inclined to look back at my life and think about the events and people who have shaped and influenced me. Some people in my life have had years to affect their impact, others passed through my awareness in a matter of hours or days but their presence changed me forever. Nathan Martinez is one of the people whom I'd credit with the most profound influence and change, especially when weighed against the relatively little time we spent together.

A little over a year ago I was recruited to participate in a Discovery Channel "documentary" (really, a reality show with a smidgen of medical testing) that would put 10 modern people in the position of living for 2 weeks with nothing more than stone age technology. We were to be provided some basic training in things like shelter building, fire propagation and basic stone tool manufacture. Due to my lecture schedule I had to receive my basic training at my then home in Santa Fe, New Mexico. The show producers selected Nathan as my coach. We were first introduced via email, which is where Nathan started my education, providing enormous amounts of written and video information on topics such as making pit earth ovens, stalking animals, dressing your kill and a host of other topics. A few days later Nathan arrived in New Mexico and my training began in earnest. I learned how to make a fire with a hand drill and base (one of the most emasculating and difficult things I have ever learned, but a skill I now tend on a weekly basis. I may never NEED that skill again, but if I do, I'll have it!) Nathan taught me how to make an Atlatl (a hand thrown spear or dart) and I began practicing

with this weapon 3-5 hrs per day for almost a month leading up to the show. Cutting to the chase, here is a highlight of what I learned from Nathan in a day in a half of training that had significant impact on my participation in the Discovery Channel show:

- I made our first fire, on our first day when the nighttime temperatures were in the mid 20's.
- I dug a seep-well, providing the group limitless fresh water.
- On day 8 of the experiment, after essentially starving for 8 days (and loosing 16lbs in the process) I brought down a 650lb elk with my hand thrown Atlatl.

I share none of this to brag but rather to illustrate what a wealth of knowledge Nathan commands and what a truly unique and valuable piece Subsistence: a guide for the Modern Hunter Gatherer is. This is neither merely a field survival guide, nor a simple anthropological accounting of archaic foraging methodology, although there are certainly survival elements and anthropological citations aplenty. This book is a theory of subsistence foraging, combined with the experience of one of the few people who have lived for extended periods of time with only the techniques and technology described here-in. This material is not based on idle speculation, but on time tested methods which kept Nathan alive in a foraging life-way. Whether you are a hunter, survival expert, anthropologist or a weekend forager you will love this book. Nothing else like it exists, which makes this work all the more valuable. Only a few generations ago EVERYONE on the planet lived as Hunter Gatherers. We are the legacy of this life-way, and this book is a major step in preserving the techniques and thought patters of this first human economic modality.

Enjoy!

With my extended family in Ejido San Jose de la Joya, atop Cerro Potosi, one of the highest mountains in northern Mexico. They live almost entirely off of goats, chickens, agave and potatoes, and build their own houses from wood cut in nearby forests.

Introduction

This book is for those who look to supplement (or even replace) their diets and incomes with top-quality wild resources, who want to get up from their desks and head outdoors, experience nature rather than just observe, follow in the footsteps of their earliest ancestors, play the game, dance the Dance. Subsistence hunting is very different from both hunting for recreational "sport" and hunting in "survival" situations. Most recreational hunters would consider the methods used in subsistence hunting to be "unsporting." Subsistence hunters use whatever method has the highest probability of bringing home dinner, and have no interest in passing up smaller deer for an elusive buck with a huge rack. Subsistence foragers prefer nets over poles, traps over guns, and nuts over greens. At the same time though, they are not like those caught unwillingly in the wild just trying to get enough food to make it back to civilization. Subsistence hunting is a way of life, the oldest profession on the planet. We certainly enjoy hunting, but it's not recreational. We hunt for food, but to thrive and not to just barely survive.

This is not a book for survivalists only looking to make it through a societal collapse. To be a successful hunter/trapper/forager, you have to *love* it, live for it, every day—RIGHT NOW. You can't just keep a book on the shelf and hope that when your stash runs out you can suddenly switch to providing for all of your needs from the wild. You must get to know your landscape intimately and completely immerse yourself in it.

This is not a book for vegetarians or the faint-hearted. You simply cannot obtain enough calories or protein solely from wild plants in most bioregions. I spent a year as a vegan, and it was hard enough just to meet my nutritional needs with modern foods. If you are concerned about man's impact on the environment, visit some soybean or corn fields, which completely wipe out biodiversity. Ranching leaves much more intact, while subsistence foragers ARE part of the environment. If you are concerned about the welfare of animals, consider several things. Contrast the lives of animals in factory farms with those in the wild. At least wild animals live out their lives with room to roam and good food, though they often die very violent deaths at the hands of predators. If death were painless, there would be little motivation to avoid it.

This is neither a book for primitivists nor focused on primitive technology. Foragers around the world have adopted modern tools and weapons. Don't forget that the Texas we live in today is not the Texas our ancestors knew. Most of us don't have a million acres to spend a full day running down a deer. Heck, if a deer's only wounded (ex. with a poisoned arrow), it's likely to cross several property lines before it drops! We don't have a whole tribe to help us drive herds of bison over cliffs. Hunting deer with spears, fishing with poison and gillnets, and setting huge fires to drive game are all illegal, yet were effective "primitive" techniques used by foragers. We have to travel long distances between hunting lands that we have to pay to use. The point being, modern tools, particularly for those without years of experience, are more effective, hands down. If you feel that using technology is immoral or unethical, then you really should think about where you draw the line. Fire is the product of simple technology, but produced by a complex thought process involving dozens of steps that

must be performed in the right order. Ask yourself, if a chimpanzee could learn to use a gun, do you think he would hesitate to use it? Both animals and contemporary foragers utilize aspects of the modern world whenever they are able to.

Resource Management & Prey Population Dynamics

The mere use of modern hunting technology alone will not wipe out populations. Foragers typically move on before completely exhausting the resources in an area, not necessarily because they are consciously trying to "conserve" them, but because it becomes harder to find them. Hard to trap that last wiley coyote or sneaky coon, too much time to bother looking for a handful of nuts hidden under the leaves, so you move on to somewhere you have not been in a while. Mountain lions do the same thing. After a kill, the local deer are spooked, so the lion often travels far away to an area where the deer have let down their guard.

While prehistoric hunters almost certainly contributed to the extinction of the megafauna (mastodons, mammoths, saber-tooth cats, ground sloths, camel, giant marsupials, etc.), it is quite probable that these animal populations were already under massive stress from climate change and disease, and humans just helped push them over the edge with projectile weapons like the atlatl. Modern human-instigated extinctions were due not to technology, but to the minds behind it. The bison were deliberately slaughtered to bring Native American populations under control. Passenger pigeons were shot for amusement. Rainforests are destroyed to make room for crops. Predators are exterminated to protect livestock, or due to a misguided desire to "protect" deer herds for sport hunters.

Technology (such as traps, even primitive ones) certainly makes it *possible* to exterminate a species. However, why would subsistence hunters and trappers want to eliminate their livelihood? It is conceivable that when the land was sparsely populated, intensive trapping to the point of temporary *local* extinction may have occurred, because there was always a new place to go. However, once humans (like any social predators) became established in a region, fierce territoriality prevented populations from relocating as easily, forcing them to conserve what they had,

broaden their prey choices, and keep the neighbors at bay with an increase in low-intensity warfare and raids.

Predators primarily target the weak, young, old and sick for a simple, subconscious reason: they are slow and require less risk in terms of energy expense and safety. By doing so, they unconsciously strengthen the entire herd. Today “sport” hunters seek to kill the largest, strongest animals. This, in conjunction with overpopulation due to the elimination of big predators, has resulted in a larger number of weaker, smaller animals surviving and reproducing, increasing the possibility of massive die-offs triggered by drought, genetic disease, etc.

The Mexican Fisherman & the Businessmen

Once there was a man who lived on a lake in Mexico. He would take his canoe and net out each morning and catch enough fish in a few hours to feed his family and sell a few at market. He would then return to his hut where he would enjoy the rest of the day with his family.

One day some American businessmen on vacation met him. They immediately saw potential for him to expand and turn fishing into a profitable enterprise. “You could spend a few more hours each day fishing, use the extra money to buy more boats, more nets and hire some employees. Then, in your old age you could use all of that money to retire on a beautiful lake with a cabin and spend the rest of your days leisurely fishing with you family.”

The fisherman looked at them and laughed. “Why go through all that trouble? I have those things already!”

Farming vs. Foraging

Why not just grow food and raise livestock? As humans invented new hunting technology, their populations grew in response to the increase in food made available. Some populations probably found themselves squeezed into no-man's land, surrounded by hostile neighbors with little to eat, and began to focus all their effort on ensuring the survival and propagation of the few edible species available (such as goats, barley, potatoes, agave). People turned to farming as a last resort, not because they grew smarter. Farming is grueling work, its monotonous, processed diet is unhealthy, and the crops highly susceptible to disease and drought. The only advantage that farming has over hunting is that it allows a person to live in a MUCH smaller area by converting all the available resources into nurturing a handful of edible species.

You cannot live off a vegetable garden. An individual needs almost 1 million Calories per year, and to get that, you are going to need to grow Calorie-dense foods like soybeans, corn, wheat, potatoes or agave. There's several good reasons that the native cultures in central and south Texas never adopted farming, even though they had farming neighbors all around them. One, the soil, terrain, rainfall and flood patterns are ill suited for it. Two, central Texas is a veritable cornucopia of wild food. With dozens of springs, streams, and woodlands, what is today San Antonio was a mecca for local bands, who could actually afford to be somewhat sedentary!

Ranching is only practical if you have an enormous amount of land. Farming in *most* of central/south Texas is not very practical at all. You would have to constantly be bringing in resources from the outside—water and fertilizer, maybe even soil, and feed for animals if you have only a little land. You would have only the illusion of self sufficiency and would be working your butt off. Today, most wild resources are largely ignored. Why slave away cultivating when you have a vast trove of wild food free for the taking?

A number of Amazonian group (such as the Huaorani of Ecuador and Yanomamö of Venezuela) have incorporated the best of both worlds,

becoming semi-nomadic hunter-gardeners. They focus gardening activities on a few high-yield, low maintenance staples (such as manioc or plantains) grow dozens of other medicinal and herbal species, and plant large fruit trees such as palms in the jungle which they will return to years later. However, they derive all of their protein from hunting and fishing in the surrounding jungles. They practice shifting horticulture, leaving fields to be reclaimed and re-vitalized by the forest for years. During seasons when wild foods are plentiful or when crops are doing poorly or not yet ready for harvest, they abandon their villages for weeks at a time and trek through the wilderness gathering whatever they find.

For those who choose to supplement their foraging with horticulture, I would recommend planting high-yield, low-maintenance native species such as persimmon, pecan, agave, sotol, prickly pear, etc. rather than the typical fare of low-Calorie non-native vegetables that is the focus of most.

Why Forage?

The answer is simple. It's the diet and lifestyle that our bodies and minds were designed for--it's healthy AND fun! Our hunting ancestors lived in small, tight-knit families and spent on AVERAGE 30 minutes to 4 hours per day obtaining the true "necessities" of life. Studies of contemporary foraging peoples show that they are almost completely free of the chronic mental and physical health problems that plague "civilized" folks. The majority of us slave away 8 to 5 only to come back to a lonely apartment and veg out in front of the TV with our drugs of choice and some cheap junk food.

Some realize this is unhealthy and break the bank buying expensive food, gym memberships, better entertainment, medications and therapy for the chronic stress of civilization. Now, if you are a millionaire, ain't saying there's anything wrong with taking that course, but how many of us can realistically afford all that? It's funny how Civilization parallels nature—any system has to be built like a pyramid, with a large stable base of rabbits, and a handful of hawks at the top. The rabbits spend long hours converting grass to energy, which the hawks then take. But without the

hawks, the rabbits would overpopulate, become diseased and maybe even go extinct! Everyone can't be hawks or rabbits; you've got to have both. The problem is, Civilization doesn't TRULY exist for the benefit of either one, but that's a topic for another book!

And in the end, even if we make a lot of money, we are still profoundly lonely—how many jobs let your kids come hang out with you at work? Our society is individualistic to the extreme. Our children are whisked away to be indoctrinated with this idea in mandatory "schooling" that sucks the life from them when they should be enjoying it most. Foraging was often an intensely communal activity, and still is. No one is too old or young to enjoy a beautiful day of gathering pecans or making jerky! Families spent their lives working together; children learned everything they needed to by imitating their older siblings, parents, cousins, aunts, and grandparents.

Fierce Paradise: The Landscapes and Ancient Peoples of Central Texas

Environments

This book focuses on the foraging range that I use, that has been the landscape of my family for generations—west to New Mexico, north to Austin, East to Galveston, and south to Saltillo, Mexico.

At the center of my territory is San Antonio, called *Yanaguana* or "sacred waters" by the Payaya Coahuilteco band. The San Antonio area was like something out of a dream for the ancient hunters. Rather than the dry desert depicted in films such as "The Alamo," it was a veritable subtropical paradise. Dozens of streams bubbled up from the ground, and along their banks grew thick jungles of oak, cyprus, palmetto, and pecan. Huge grapevines and long flowing beards of Spanish moss hung from the branches. Alligators sunned on the banks and jaguars and ocelots stalked the shadows.

San Antonio sits dead in the center at the crossroads of several very different bio-regions: The Chihuahuan Desert to the west, the Edwards Plateau to the north, Post Oak Savannah, Prairie and Piney woods to the

east, South Texas Plains and Tamaulipan Desert to the south. The Balcones Escarpment rises in northern San Antonio, splitting the city in two along an ancient fault line. It is from the base of this fault line that springs by the hundreds emerge, braiding together and meandering their way towards the Corpus Christi Bay.

The **Edwards Plateau** is higher in elevation than all the surrounding areas, and warm humid air from the gulf is pushed up, cools, condenses and falls along its southern and eastern edges, leaving the central portion in a drier rain shadow. The soil is thin caliche overlying karst limestone geography, although rich deposits of soil can be found in river valleys. The ground is riddled with caverns, which began as small fissures in the rock and were then carved out by water and decorated with spectacular flowstone and stalactite formations. Live oak, juniper (also known as cedar), elm, persimmon, and cyprus are the dominant plant species. The Plateau has one of the highest white-tailed deer populations in North America, and they are still hunted by the occasional mountain lion in more remote areas. Black bears also once foraged here, and on rare occasions sightings are still reported that can probably be attributed to bears wandering in from their ranges in the Serranias del Burro and Maderas Del Carmen mountains in Coahuila, Mexico.

The **Chihuahuan Desert** receives very little rain, and xerophytic plants thrive. Lechuguilla (a small agave) sotol, a number of acacias, cenizo, leatherstem (a nut-bearing euphorbia) and small cacti like pitahaya and horse crippler dominate the uplands. Although it may look flat from the highway, the region consists of mazes of deep canyons and arroyos that empty into the Pecos, Rio Grande and Devil's Rivers. The canyon bottoms are another world, where walnuts, acorns and cattail can be found in surprising abundance. The skunk, bobcat, grey fox, porcupine, quail, rattlesnake and collared lizard abound—although coyotes and mountains lions have been virtually exterminated by poisoning and aerial assault to protect livestock. The canyons are filled with rock shelters whose walls are often completely covered by brilliantly colored murals left behind 4,000 to 2,000 years ago by a people known only from the extensive and

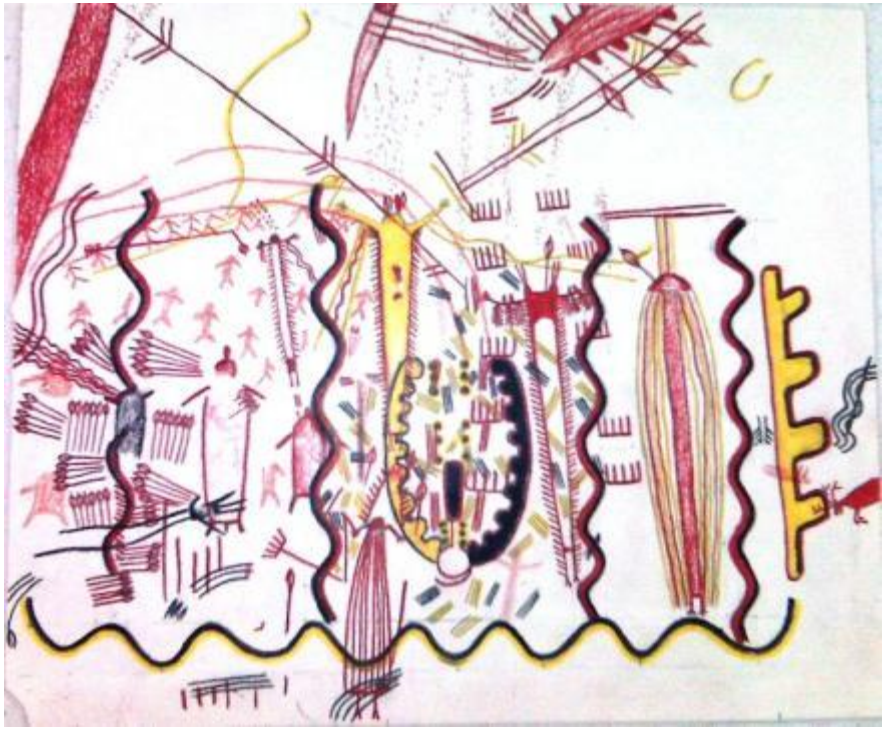
well-preserved archaeological record left buried in the huge middens found in the same shelters. During much of the year, sotol and agave processing was of enormous importance—discarded fire cracked rock from earth ovens forms huge talus slopes flowing out of the rock shelters. Fine grey dust or *anthrosol* composed of ash and charcoal and decomposed plant material covers layer upon layer of discarded lechuguilla and sotol fiber.

My brother standing on the huge midden in the cathedral-like Fate Bell Shelter in Seminole Canyon

Aside from dunes that mark the remnants of ancient coastlines, the **South Texas Plains** are vast and flat, composed of sand and clay that settled at the bottom of a shallow sea. Once composed of tall grasslands dotted with islands of oak, mesquite and palm forest, overgrazing has resulted in the spread of species that are somewhat more resistant to cattle. Spiny huisache, prickly pear, mesquite, Spanish dagger and agarita form dense, impenetrable thickets. Rattlesnakes are abundant, as are javelina, coyote, bobcat, and even mountain lion.

The Peoples

Rather than try to re-invent the wheel, learning by trial and error, it is very useful to look at historic and archaic foraging cultures in this and similar bioregions to glean as much as possible.



My rendering of a tiny portion of a spectacular, possibly 4,000 year mural painted on a rock shelter at Cedar Springs near the Devil's River

An excellent place to start is "The Account" by Cabeza de Vaca, who was shipwrecked on the coast in the 1500's and walked across much of Texas and northern Mexico, living with and learning from the nomadic peoples he encountered. The book is one of the first attempts at ethnography, describing in vivid detail the cultures and subsistence activities of some of the toughest, and perhaps oldest of the foraging peoples in North America. The Native peoples of central Texas were divided into 3 linguistic groups: **Coahuilteco** (the largest, and most diverse, extending from San Antonio west to Del Rio and south into Nuevo Leon and Coahuila), the **Karankawa** (northern Padre Island, Mustang Island, and the bays bordering the Laguna Madre) and the **Tonkawa** or Titskanwatich (Hill

Country). While often considered to be a language Isolate, the dozens of Coahuilteco dialects are thought to be related to Seri (Baja California) and the Hokan languages of California. In addition, the plosive phonology (popped consonant sound system) is very similar to that of Maya and the languages of the Pacific Northwest (Kwagiulth, Tlingit, etc.) This implies that the Coahuilteco were part of an ancient lineage and were cut off thousands of years ago from related linguistic groups by a wedge of Uto-Aztecan speaking invaders (Jumano, Hopi, Guachichil, Chichimec, Otomi, etc.) This isolation by hostile neighbors, as well as intra-group warfare and the vast, often harsh landscape, resulted in central and southern Texas becoming one of the most linguistically diverse and interesting areas in the world.

As far as material culture, the Coahuilteco and their neighbors were some of the most "primitive" in all of the Americas. They wore few or no clothes and often slept under the stars or beneath simple brush shades and windbreaks. They hunted with longbows, spears, and rabbit sticks (non-returning boomerangs). They moved with the seasons, following the rains, game and ripening plants. The prickly pear, mesquite, pecan harvests and large-scale rabbit drives made it possible for usually dispersed small related bands (perhaps 10 to 30 in each) to come together by the hundreds to exchange news, find mates, and hold the all-night ceremonial Mitote dances during which copious amounts of the "black drink" were consumed along with potentially deadly hallucinogens like mountain laurel and datura, the milder peyote, and fermented mesquite and prickly pear juice.

*The **Black Drink** was likely a concentrated tea made from the caffeine-rich roasted leaves of the yaupon tree (Ilex vomitoria), which is a relative of the tree from which the south American drink mate is made.*

Our re-creation of brush wickiups at the White Shaman Preserve. Note the large stones around the base—stone circles persist for thousands of years

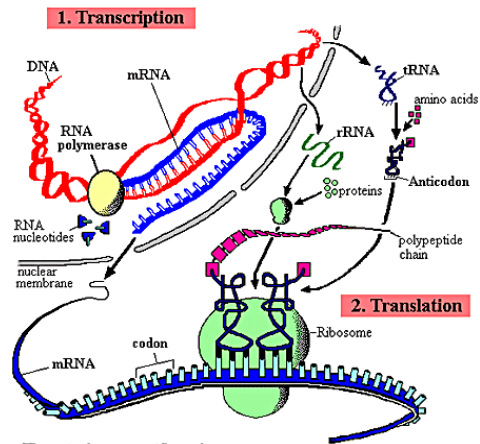
The Coahuilteco were often fiercely territorial and in a constant state of low-intensity “warfare” (more like blood feuds) with bands that spoke other dialects, or sometimes even with related bands. Actual engagements often amounted to hit-and-run ambushes and raids, aimed at extracting revenge, capturing mates, or stealing supplies (more for the prestige than for the actual value of the items).

Shortly after the Spanish re-introduction of horses to the Americas, Coahuilteco lands were invaded by mounted raiders—the Comanche and Lipan Apache. Hemmed in on all sides, the Coahuilteco turned to the Catholic missionaries, who offered protection and food within the walled mission compounds, which were built with native labor. Most were converted, stripped of their culture and assimilated into the Spanish melting pot. A few went underground, following the Christian faith by day, but holding Mitotes by night. Contrary to statements by many historians, they did not go extinct. Their descendents can still be found throughout South Texas and Northern Mexico. Chances are, if you can trace your ancestors back a few hundred years here, you are amongst their descendants as well.

Subsistence Nutrition

A calorie with a small "c" is the amount of energy required to raise 1 ml of water by 1 degree Celsius. A Calorie with a big "C" is 1000 of these (also written kcal). When you hear that you need about 2,000 Calories a day to survive, this is what it is referring to.

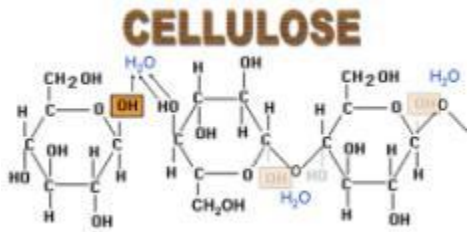
In the typical modern, processed diet, we have too much fat and carbohydrates, and too little protein, fiber, vitamins and minerals. Vitamins and minerals are MICRO nutrients—you only need a small amount to meet your needs, and that amount is usually measured in milligrams. Fat, carbs, and protein are MACRO nutrients—these are the sources of CALORIES and you need more by weight. With hunter-gatherers, the problem is reversed—its easy to get enough protein and vitamins (from a handful of fresh greens, fruit or raw meat), but hard to get enough Calories. Foragers risk their lives to obtain fat and sugar—sticking hands into beehives 100 feet up in the rainforest canopy, or harpooning huge whales in the freezing Arctic Ocean from fragile umiak boats. Its not that they consciously know why they need those nutrients—it's just the human sweet tooth! The problem is that the instinct to gobble as much sugar and fat as possible while the going was good backfired when humans became domesticated and had unlimited access to these goodies!



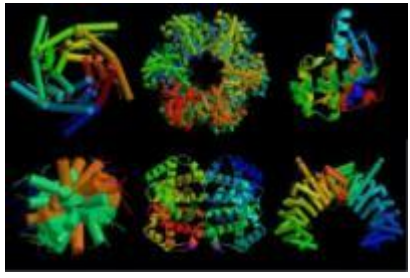
Protein synthesis

Protein is in a category of its own –it provides not only energy, but is composed of chains of amino acids that the human body cannot manufacture or store for a rainy day. Animal protein is complete, providing all of our essential amino acids, whereas most plant sources alone (mostly from nuts and

seeds) do not provide all of them. Remember, a good chunk of the nutrients and energy in a plant cell is indigestible to humans due to being locked away behind walls of cellulose.



Cows, monkeys and grasshoppers have special digestive systems and symbiotic bacteria that can break cellulose bonds, but we don't. Amino acids are the building blocks of everything in our bodies, from hormones to muscle. If we don't get the minimum requirement every day (about 70 grams) we slowly deteriorate, atrophy, experience mood swings, and will eventually die. On the other hand, if our diet is composed of too much LEAN protein (like jackrabbit) our excretory system overloads with the byproducts of the body trying to convert too much protein directly to energy compounds. As long as the body has another source of energy (carbs or fat) this will not happen, which is why the Inuit can survive on a diet composed almost completely of meat.



The functions of proteins are determined by their twisting shapes, which can be incredibly complex

It is often stated that the majority of forager diets were composed of plants. This is misleading in several ways. By WEIGHT, this is sometimes true, but much of that weight is empty fiber. One must consume or process huge quantities of these plants (think palm heart or agave) to get enough calories. It is also important to remember that most surviving foragers live in marginal areas (extreme deserts, jungles, wastelands) and that their diets do not necessarily represent what a forager diet would have been like in a truly prime area. The Aché of Paraguay live in what

could be considered superb habitat. Their diet is composed mostly of meat, and at times they consume in excess of 3,000 kcal/day. When plants DO make up a majority of the diet, it is often only during a particular season. Only roots, tubers, hearts, fruits, nuts and seeds contain enough Calories to serve as staples. The first 3 may be available throughout the year, but the usable energy content and palatability varies widely depending on environmental conditions and plant maturity. The energy comes primarily from sugars and starches, with oils being found mostly in nuts and seeds. Complex starches are harder to break down and digest, whereas simple sugars can enter the bloodstream almost immediately, hence, our sweet tooth! The scarcity of such foods in the wild may be the reason why certain populations (particularly here in central Texas) whose recent ancestors were unaccustomed to consuming them regularly in huge quantities have such a high rate of diabetes and obesity. There is a big difference however between consuming sweet plant foods such as agave and mesquite, and highly refined products like wheat flour and sugar. The wild foods contain high levels of fiber and complex starches, and lower levels of simple sugars. They do not cause such massive spikes in blood sugar content, and are said to have a low *glycemic index*.

Lipids (fats, oils and grease) are gold to the hunter. While sugar, starch and protein contain only 4 kcal/g, lipids contain a whopping 9 kcal/g! Today, consuming large amounts of fat is associated with cardiovascular disease and obesity, but for some foragers, particularly in the Arctic, fat makes up a substantial portion of their diet, yet they remain perfectly healthy. The secret is two-fold. One, hunters are extremely active, and burn off the fat as rapidly as they consume it. Two, much of the fat that we consume today is from domestic animals that are themselves extremely unhealthy and overweight, a kind of fat that is found at much lower levels wild animals.

In the summers of 2004 and 2005, I spent several months with the Nuu-chah-nulth and Kwagiulth in British Columbia. Abundant resources from the sea and land enabled them to become semi-sedentary and develop a rich, complex culture, part of which consisted of the potlatch ceremony. Individuals would accumulate enormous wealth, then give most of it away during a spectacular night of dances and long-winded speeches. Tl'iina, or oolichan grease (a thick, clear oil extracted from smelt) is a valued commodity, sometimes selling for several hundred dollars a gallon. It is used for many things, including as a dressing for dried seaweed, and mixed with fresh berries for a delicious desert. During the potlatch, it would be drunk from large spoons and deliberately spilled, as well as tossed into the fire to demonstrate fabulous wealth. A number of other unusual high Calorie foods are highly prized, such as t'uts'up (sea urchin ovaries) and k'waqmis (herring eggs deposited on kelp).

Optimal Foraging Strategy

In a nutshell, optimal foraging theory states that organisms spend most of their time and energy looking for foods that have the biggest payoff with the least risk--you try to get the most reward with the least amount of effort, get the biggest bang for your buck. It's kind of like economics, but the currency is Calories and time. Hunting big game is risky—you might spend a lot of time looking for a deer and come up empty handed, or you might get trampled by a bison. If you get one though, the reward is huge—enough Calories to last for months! On the other hand, trying to survive off mice is also risky. You would need about 40 a day to survive and you could spend all day just setting traps for them. When you plot prey species on a graph by population density and energy content, you get a bunch of medium sized, relatively common critters (coons, possums, etc.) clustered together in the middle. Typically one of these will last you a couple of days. You concentrate most of your time on trapping them. Everything else, you pretty much hunt opportunistically. If a mouse

wanders up to your campfire (which has happened to me!) you grab him and chow down. If you are out for a stroll and you surprise a deer 15 yards away from you (ALWAYS carry your weapon), take the shot! And these opportunities present themselves far more often than expected when you spend a lot of time out in the wilderness!

Optimal Foraging also entails conserving Calories whenever possible. Hunter Gatherers therefore often spend great amounts of time ***resting****, to conserve energy as well as water in hot, arid environments. I remember reading a story somewhere—a linguist was trying to discover the root word for "run." The hunter would use the word in long sentences, such as "I was running after a deer through the forest" finally, exasperated, the linguist said: "Just say 'I run'!" The hunter asked "Why?" Linguist: "I don't know, maybe just for enjoyment!" Hunter: "Why would I just go run for no reason?" Europeans often derided hunter-gatherers for being lazy, but really they were just being thrifty. Exercise is a luxury for the wealthy and well-fed, almost unheard of in societies that get plenty enough of that in the daily course of their lives.*

While foragers know and utilize hundreds of edible plants and animals, only a handful in any given area are plentiful enough and rich enough in calories to be considered staples—foods that provide the bulk of the diet and are the primary focus of the time and effort of the forager. So, while dewberries are easy to find, and very tasty, they are very tedious to pick one by one (it would take several thousand to get enough Calories for one day!)

In addition, modern artificial regulations further constrain the menu with seasons, bag limits, and "lawful" means. Hence, the focus on non-game animals (with the exception of deer and javelina) that have few if any restrictions, and the exclusion of popular "sport" species, such as birds (turkey, dove, quail, duck, etc.)

Specialized vs. Broad Spectrum Foraging

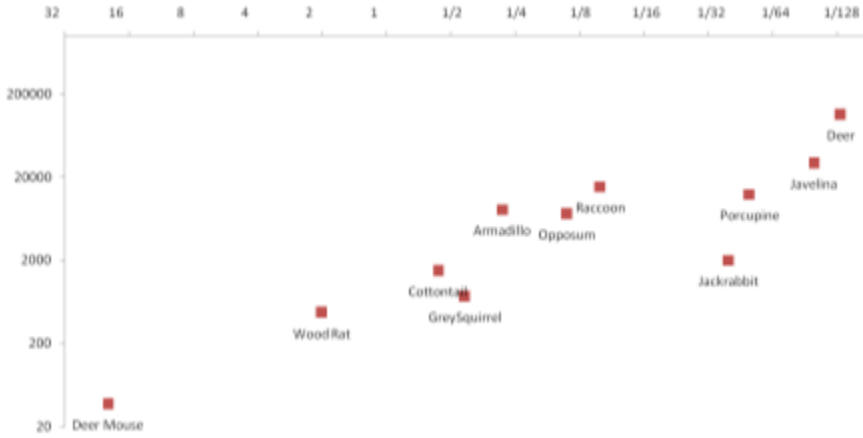
The following are sample strategies for a single person requiring 2,500 Calories/day for one year.

The ratio of lipid, protein, and ash content on a Dry Matter Basis has been calculated for a number of whole vertebrate foods for the purpose of zoo nutritional studies (ex. If we feed this deer to the tiger, how long will he be good for?) I have calculated my numbers based on these ratios using animal weights that are median or on the low end so as to give a conservative estimate of whole Caloric content. To quickly estimate the minimum amount of calories in a whole vertebrate, take its weight in grams and multiply by 2. (Remember, well over half of an animal's weight is water, but it also contains fat which has more calories per gram). However, one must keep in mind that the fat content of an animal can fluctuate widely with the seasons and age, and its whole Caloric value may be MUCH higher than the estimate (1 lb of fat contains about 4,000 kcal)

The caloric values of most plant foods were already available. For those I could not locate, I used a similar species to get an estimate.

Population densities are estimates based on my observations and trapping experience. I have set the kill rate (% of population taken each year) generally between 10% and 20% (an actual number of deer taken by hunters in Texas one year came out to about 12.5%)

Next Page: *Whole Caloric Value (kcal) vs. Population Density (individuals/acre)*



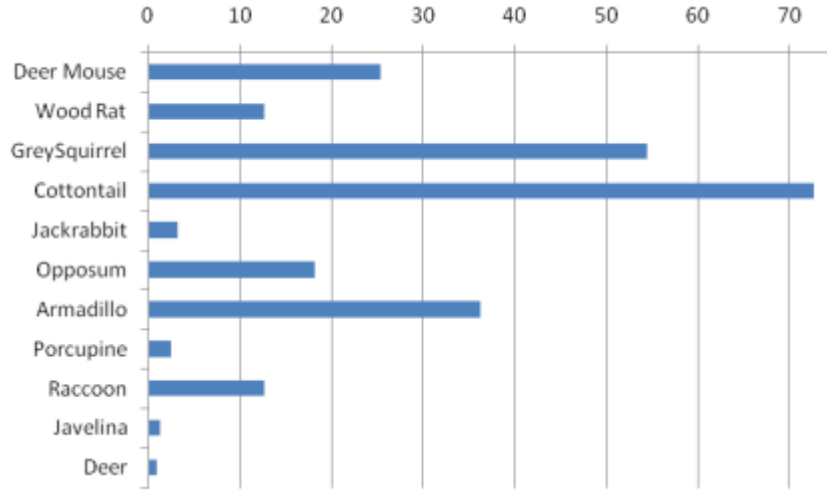
Single Species (Specialist)

Species	Individuals required/year*	Range Size (acres)	hrs. work/day
Deer Mouse	24,390	4,878	33.4
Wood Rat	1,949	3,898	3.6
Grey Squirrel	1,245	29,056	3.4
Cottontail	614	10,747	2.2
Jackrabbit	454	181,744	2.1
Opossum	127	8,902	0.7
Armadillo	112	3,934	0.9
Porcupine	73	36,597	0.6
Raccoon	59	5,938	0.3
Javelina	31	31,085	0.5
Deer	8	4,054	0.1
Pecan	6	3	0.2
Acorn	13	3	0.3
Mesquite	68	11	0.7
Sotol	95	95	1.3
Persimmon	158	16	0.4

*For plants, “Individuals required” refers to how many individual trees or hearts must be harvested

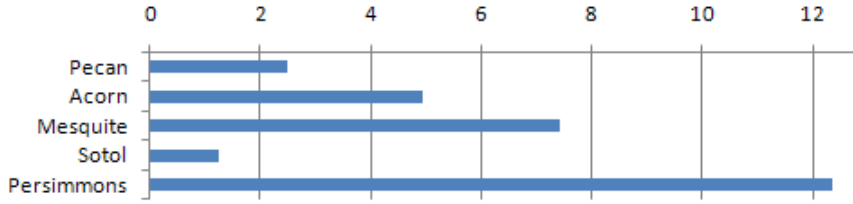
It is interesting to note that the smaller species require more work per day, with the mouse at the extreme end, requiring more hours than there is in a day! If I were to specialize in a single species, I would definitely either go with deer or pecan.

Broad Spectrum Carnivore



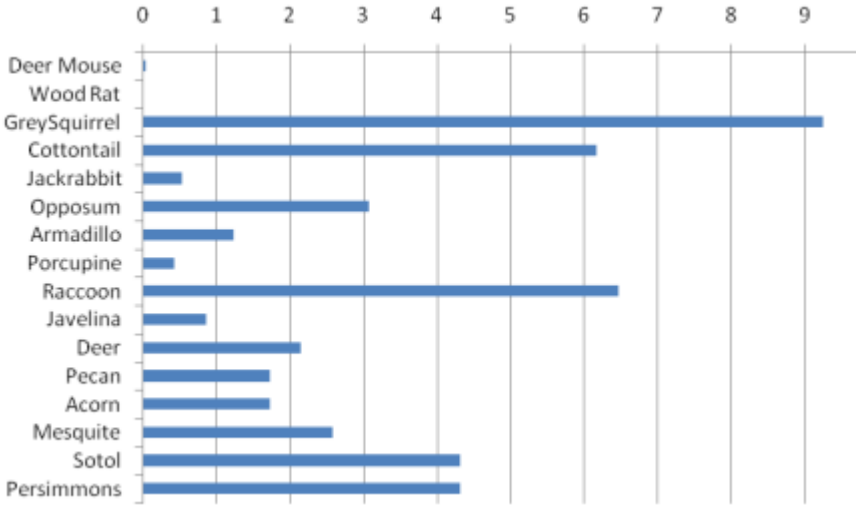
The above strategy would require 1,269 acres (about 2 sq miles) and would require on average 61 minutes of work per day.

Broad Spectrum Vegetarian



The above strategy would require 1 acre and would require on average 19 minutes of work per day. This is obviously the most efficient strategy to obtain Calories, though it is protein deficient and these good harvests can only occur in a very limited area (rich bottomlands) and are prone to drought failure.

Broad Spectrum Omnivore



The above strategy would require 216 acres (about 1/3 sq miles) and would require on average 21 minutes of work per day. This closely approximates my actual foraging strategy, as demonstrated below:

Prey Taken during 5 weeks of trapping, 2010-2011

Skunk	14
Coon	6
Possum	6
Jackrabbit	5
Fox	3
Bobcat	1
Cottontail	1
Porcupine	1

During the same season I also took by hunting: 1 feral goat, 2 feral sheep, 4 jackrabbits, 4 porcupines, 8 cottontails, 2 javelinas and 2 deer

Trapline 1: 3 weeks, 6 miles on 2,000 acres, 40 snares, 7 conibears, 3 footholds
Trapline 2: 4 days, 200 yards on 100 acres, 6 conibears 1 foothold
Trapline 3: 10 days, 100 yards on 7 acres, 4 snares, 3 conibears

Prey Taken during 3 weeks of trapping, 2011-2012

Coon	5
Possum	4
Fox	3
Cottontail	2
During the same season I also took by hunting: 5 feral sheep, 2 deer, 3 cottontails and 2 jackrabbits **Trapline 1:** 3 days, 200 yards on 500 acres, 6 snares **Trapline 2:** 2 weeks, 1 mile on 2,000 acres, 7 conibears, 1 foothold **Trapline 3:** 1 day, 50 yards on 20 acres, 3 conibears, 1 snare **Trapline 4:** 3 days, 0.5 miles on 200 acres, 6 conibears	

A Forager's Year (Calendar)

It's a good idea to plan a general schedule of foraging activities for the year, but keep it flexible. Maybe there's a windfall pecan harvest on its way, maybe the persimmons ripen early or not at all, maybe a hurricane is pounding the coast—you just never know.

This is pretty much the round of the seasons that I follow (My year really begins with the Mesquite harvest)

July—August: Mesquite and Prickly pear, Freshwater Fishing

August to October: Persimmons, Small Game Trapping

November: Deer Hunting, Pecans

December—February: Commercial Trapping, Deer, Acorns, Hackberries, Oysters

March-June: Sotol, Onions, Agaritas, Oysters, Mullet, Spanish Dagger Fruits, Wild Grains

Estimated Expenses

Licenses/Permits

- Super Combo Package (Hunting, Fishing (salt & freshwater) $68
- Resident Trapping $19
- Archery Stamp $7
- Reptile and Amphibian Stamp $10
- General Commercial Fisherman's License $26
- Bait Dealer's License $38
- Permit to sell non-game fish taken from public fresh water $60
- Annual Public Hunting Permit $48
- National Park Service Annual Hunting Permit $20
- State Parks Pass $70
- Total: $366

Gas: $500 (traveling 100 miles between camping locations every 2 weeks, 18 mpg at $3.47/gal)

Misc. Expenses: $500

Auto Insurance: $600

Ammunition: $50

Total: $1,516-$2,016

By living semi-nomadically, travelling by car or boat between foraging areas, utilizing inexpensive modern technology, and preserving foods during times of plenty, one person could live a life almost completely free of reliance on modern society, enjoying a very healthy life of relative leisure, all paid for by a few hard weeks of work harvesting pecans, running a trapline, and selling surplus fish.

Why don't more people do this? For one, this life is pretty Spartan. No eating out, no running water, no AC, no expensive entertainment. The biggest problem though is the lack of companionship—humans are

intensely social creatures. The majority of us are acclimated to the modern world, so much so that we cannot even imagine that such a way of life exists or is even possible. We truly BELIEVE that we need all of those things to be happy, and considering the state of society, we probably DO need those things—substitute pleasures, drugs for minds that have no problems to solve, whose foraging is limited to emotionlessly roaming the isles of the supermarket, whose powers of observation lie mostly dormant, in a world where everyone survives no matter how hard they work, where women choose weak drugged-out boys to father their children. We are profoundly alone in a sea of people, where true relationships are truly trivial and meaningless and cooperation is limited to grudgingly chipping in for the next case of beer.

Students gather for a meal of tarantulas, mice, lizards, porcupine, sotol and mesquite cakes after a long day of foraging during a full-immersion youth program

Hunting & Trapping

General Hunting Regulations Relevant to Subsistence Activities:

Game animals *and* ***game birds*** *may be hunted with any legal firearm,* ***EXCEPT:***

- *white-tailed deer, mule deer, desert bighorn sheep, and pronghorn antelope may NOT be hunted with rimfire ammunition of any caliber.*
- *pellet guns and other air guns are* ***NOT LEGAL****.*

Nongame Animals (Non-Protected): *Any lawful firearm, pellet gun, or other air gun is legal.*

There are no restrictions on the number of shells or cartridges a legal firearm may hold when hunting game animals or game birds (except migratory game birds)

Longbows, compound bows, or recurved bows:

- *there is no minimum draw requirement.*
- *devices that allow a bow to be locked at full or partial draw are lawful during any season when lawful archery equipment may be used.*
- *When used to hunt turkey and all game animals other than squirrels, a projectile must be equipped with a broadhead hunting point that is at least 7/8-inch in width (upon impact) and has a minimum of two cutting edges. A mechanical broadhead must begin to open upon impact and, when open, must be a minimum of 7/8-inch in width.*

Traps *may not be used to hunt game birds or game animals,* ***Dogs*** *may not be used to hunt deer in this state.*

Species

Note: the following species have no seasons or bag limits unless otherwise noted.

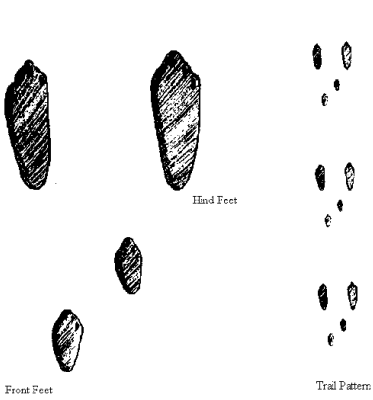
Fox Squirrel, *Sciurus niger,* 1-2 lbs, **740 kcal**

This large squirrel is very common in oak woodlands throughout central Texas. It is particularly active in the late morning and late afternoon, when it comes down from the trees to forage for acorns, pecans and seeds. Look for balls of leaves and sticks (called dreys) high in the trees—these are squirrel nests, and listen for their clucking calls and piercing barks. While bold in developed areas, in wilder areas these squirrels become very cautious and stealthy once they think they've been spotted. They flatten their bodies against the upper sides of branches, or trunks opposite the danger. They remain quiet and very still until they believe the danger has passed. If one has the patience to wait them out, they can easily be located again as they bound through the branches.

They are very tasty, as they often have more fat than rabbit. I fry them up or gut and toss the whole squirrel onto the coals if I don't plan on saving the skin. The hairs singe off and the skin serves as a cooking shell and helps seal in the juices and fat.

No closed season in south Texas

Rabbits: 2-3 lbs, **1,500. Hares:** 4-8 lbs, **2,000 kcal**



Active during the night, early morning and evening, these common critters take refuge under thick brush during the day, but can be easily flushed out. They freeze or become caught in artificial light at night. Cottontails will run a short way *then* freeze—if you pretend not to see them! Jackrabbits will really book it, so it's best to just take a shot if an opportunity presents itself. Both can be easily snared—place the snare in a trail or under a fence. Cottontails tend to be found on the edges of forests while jacks prefer open brush land.

Armadillo *Dasypus novemcinctus***,** 12-17 lbs, **8,000 kcal**

These armored Texas icons stay in burrows during the day and are active in late afternoon and night. They have poor eyesight and can easily be approached while they are rooting in leaf litter for ants and termites and cannot hear you. They are amongst the tastiest of small game, comparable to pork with plenty of fat.

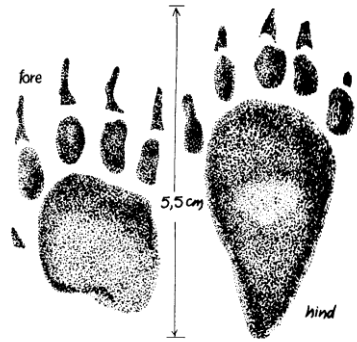
While it is true that armadillos can transmit leprosy to humans, thorough cooking kills the bacteria making the meat safe to eat. The greatest danger for contracting the disease occurs during handling of the raw carcass—wearing sturdy disposable gloves is always recommended.

Opossum *Didelphis virginiana,* 4-14 lbs, **7,000 kcal**

These bizarre marsupials are very similar in habits to the armadillo, only they are able to climb trees. They have dens in the trees or in holes in the ground--sometimes in abandoned armadillo burrows. They become active shortly after the sun sets when they come down to forage. They can be hunted with spotlights or caught with simple baited traps. I sometimes place a conibear trap in the entrance to their dens and cover it with a rock so that I will not catch anything else.

It's important to be very careful when simmering the skulls, as the bones are often not fused together and the skull can easily fall apart.

Porcupine *Erethizon dorsatum* 7-40 lbs, **12,500 kcal**



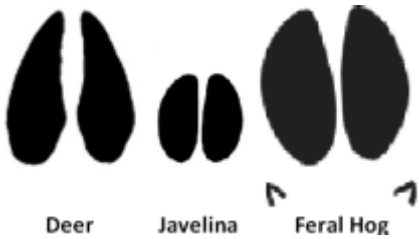
These large rodents are hard to spot in the Hill Country but can easily found in the Chihuahuan Desert. They may freeze when they sense danger, and contrary to popular belief, cannot shoot quills (they WILL try to back into a predator or swat with their tails). They are often seen dead on roadsides and have poor eyesight and hearing. They tend to be unafraid due to a lack of natural predators other than the mountain lion, which is now extremely rare. They feed on tree bark and sap and are especially fond of ocotillo in west Texas, where their chewing marks can been seen on many stems. They spend the day in rock crevices or trees, which can often be located by large piles of small banana-shaped droppings at the entrance. Quills, skulls and claws can be sold, but only when taken from private lands. This is the easiest of all medium sized Texas mammals to hunt.

During one youth program, I set aside one day for full-immersion—no going inside or eating modern foods. Before the sun rose, we ate 2 porcupines that I had previously caught and pit cooked, and then spread out in a line over a mile of desert. A group of kids found a HUGE porcupine, and with the help of an adult, killed it with just a rock. They then tied it to a stick and carried it back to camp cannibal-style with a huge boost in confidence in their ability to survive the day!

Raccoon *Procyon lotor***,** 8-62 lbs**, 15,400 kcal**

These extremely intelligent and curious animals should be one of the primary targets of the subsistence trapper. They are very common in all areas of Texas, but especially like to frequent ponds, puddles, stream banks and even the beach, where their tracks can be found covering the muddy ground. Their forepaws are very prehensile, and they use them to probe beneath water, rocks, and logs for small prey. They prefer to den in large hollow trees or fallen logs, and these can often be identified by the large piles of seed-filled droppings found at the base.

They are extremely strong and resilient, and can become quite vicious when trapped. I have know them to almost completely unravel steel snare cable and to keep snarling after a direct gunshot to the brain—so use caution, especially as they are a major carrier of rabies. They put on a very thick layer of fat in the fall, which can be saved and rendered.



Javelina, *Pecari tajacu*, 35-60 lb **29,400 kcal**

The collared peccary is a distant relative of the Old World pig. They travel in small herds, ripping into and feeding on prickly pear patches, sotol and agave hearts, and rooting around for small animals. During the hottest part of the day, they retreat into deep brush, rock shelters and crevices. Their eyesight and hearing are very poor, and they can be easily approached while feeding. However, one should exercise caution, as they are equipped with very long, self-sharpening canines that are worked by massive jaw muscles.

They have a small scent gland that opens onto their back and emits a powerful musky odor—I often smell them before I see them. It is important to remove this scent gland when skinning, so that the flavor of the meat is not tainted (it could still be eaten, just would taste really unusual).

No closed season in South Texas, ***Bag Limit:*** *2/year*

White-tailed Deer, 90-200 lbs **112,500 kcal**

Central and South Texas have huge deer populations, and they can even be seen deep within large cities, such as San Antonio. The rut occurs in the fall—bucks are fighting and does are on the run, and these distractions lower their guard and make them more vulnerable to the hunter. They give birth in the spring. During midday, deer retreat to areas of thick brush, deep forest and tall grass.

They feed on a variety of fresh growth, shrubs, tree leaves and especially like acorns. However, a number of deer that I have killed have had corn in their stomachs. Constant feeding by well-meaning folks and spreading urban sprawl where hunting is not permitted have resulted in a population explosion that I believe is causing deer body size to decrease.

Archery: *Sept. 29-Nov. 2*

General: *Nov. 3-Jan. 20*

Bag limit: *5/year, max 3 bucks.*

Exotics (Axis deer, feral goats, sheep, and hogs)

The animals are descended from those that have escaped from farms and ranches, or were deliberately released. They are often considered pests, as they compete with native wildlife for food, often destroy vegetation and cause soil erosion.

Axis deer and feral hogs are active at night and early morning and are particularly abundant in lowlands and near creek beds. Feral sheep and goats retreat to canyons and rock shelters during the hottest parts of the day and climb to the uplands to graze in the morning and evening. They are extremely common in west Texas.

Exotics should be particularly targeted by the subsistence hunter:

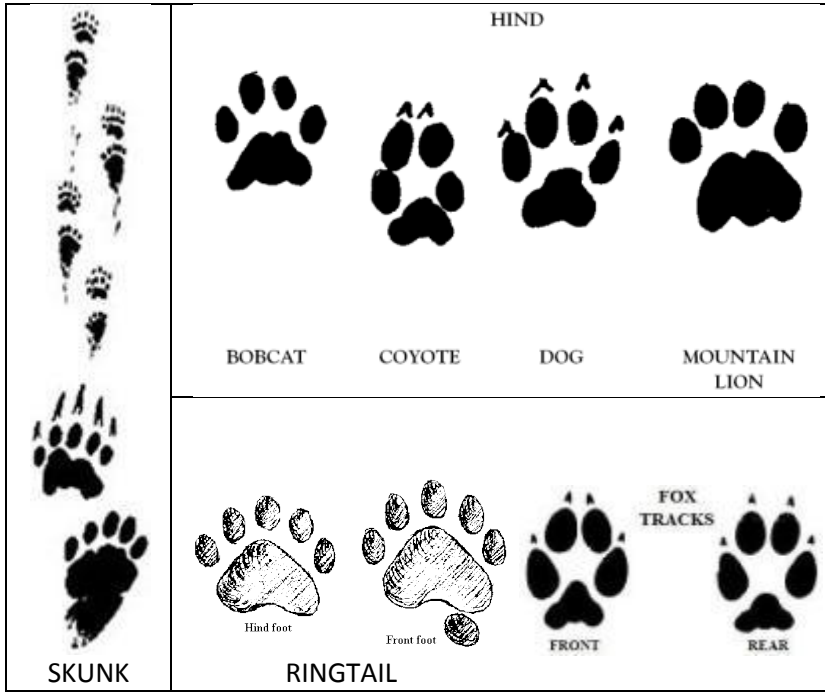
There are no state bag or possession limits or closed seasons on exotic animals or fowl on private property. They may be hunted with any device or trap legal for nongame.

Feral ram taken with an Ak-47 near the Pecos River

Furbearers (fox, skunk, bobcat, coyote, ringtail)

These typically don't make up part of my diet, though I have sampled most of them. Due to their frequent, often violent contact with other animals, predators have a higher likelihood of carrying deadly diseases, and I am extra cautious when approaching and processing them. They are however the mainstay of commercial trapping. These animals (except for Coyote) tend to be strictly nocturnal or active in the very early morning. They are widespread, but all tend to use canyons and drywashes as highways, and prefer thick brush. Ringtails, spotted skunks (civet cats) true cats, and grey fox are sly and rarely seen, while coyotes and striped skunks are more brazen and common.

Left to right: *Case-skinned Ringtail, Hog-nosed & Striped Skunks, Grey Fox*



Urine can be extracted with a sharpened turkey baster and saved for a very effective lure. Skunk scent glands are extremely potent, and the scent can be detected by predators miles away.

Animals that fall under Texas furbearer classification are:

- *Badger, Beaver, Fox, Mink, Muskrat, Nutria, Opossum, Otter, Raccoon, Ring-tailed cat, Skunk (Coyote & Bobcat are classified as nongame)*
- *A **trapper's license is required to take or attempt to take fur-bearing animals**, except that a person who possesses a hunting license may take and possess a fur-bearing animal, provided the furbearer (or any part thereof) is not to be sold.*
- *Fur-bearing animals may be hunted at night on private property with the aid of an artificial light.*
- *There is no bag or possession limit for fur-bearing animals.*
- *The take of **any** nongame (such as turtles, rabbits) species for commercial purposes (sale, offer for sale, barter, or exchange) from **public** lands or waters is **unlawful**.*
- *Furbearers may only be trapped for **sale** during the commercial trapping season from No. 1 to March 31*
- *Fur-bearing animal carcasses and their untanned (green or dried) pelts can only be sold by licensed trappers, and at any time providing they were legally taken during the season for commercial trapping.*
- *Finished products (tanned pelts, cleaned skulls) may be sold by anyone*

2012 Fur Auction Prices

(Stretched and dried only. Tanning often doubles or triples the value)

	Average	**Top**
Squirrel	$0.91	$1.60
Skunk	$3.69	$23.00
Raccoon	$8.94	$14.00
Coyote	$21.17	$76.00
Grey Fox	$29.34	$49.00
Badger	$41.21	$175.00
Bobcat	$68.00	$1,275.00

2012 Retail Prices for well-cleaned skulls

(Wholesale is usually 1/6 of this)

Striped Skunk	$35
Spotted Skunk	$45
Opossum	$50
Ringtail	$60
Raccoon	$60
Grey Fox	$70
Coyote	$70
Armadillo	$70
Bobcat	$80
Javelina:	$190

Arthropods, Reptiles and Rodents

These animals serve more as protein rich snacks rather than a source of Calories. A few handfuls of grasshoppers, 5 mice, or a nice rat will completely meet your daily protein requirements, although to try to make them a substantial source of Calories could be very tedious!

I usually carry and set a few mouse and rattraps in camp. In addition to great snacks, they can be used to bait larger animals. Set traps in hollow trees, rock crevices, and along the edges of walls and embankments.

Most lizards here are very small and fast, but the alligator or fence lizard and some collared lizards are large enough and slow enough to make them worth occasionally going after. As their name implies, they like to hang out on fence posts, and are also especially fond of oak trunks, with which they blend almost perfectly with their camouflaged skin. I often eat them whole, bones and all, but if you do that and don't gut them, make sure to cook thoroughly—their guts are filled with semi-parasitic worms that aid in their digestion!

Other small lizards, skinks, snakes and tarantulas (which taste like crab!) can easily be found by lifting up large stones and fallen logs. Always do this carefully though, as there are a number of poisonous snakes and spiders that also like to chill under rocks!

Grasshoppers, or *chapulines*, are still a popular food in southern Mexico—they are gathered by the hundreds by dragging long insect nets through the grass. Lightly roasted or fried, they turn red within seconds like little lobsters. A few seconds in some hot coals burns off wings and long appendages and neutralizes the bacteria in their gut.

It's not really practical to go after most insects one at a time, as most contain far less than 4 kcal or 1 gram of protein. However, there are certain rare occasions when insect populations explode and it would be worth your while to focus all your energy on collecting them. In 2007, black crickets swarmed around parking lot lights. At other times, clouds of flying termites are blown into pools. June beetle populations also

regularly reach such numbers that hundreds could easily be collected by placing a light behind a sheet hung over a bucket of water. Once I chopped open a log to find it hollow and full of thousands of large wood ants and larvae, which I just dumped into a bag all at once! I have split wood and found huge wood boring beetle larvae inside (similar to the prized Australian witchety grub). If you find yourself having to rely on consuming large amounts of insects and have a weak stomach, you can dry them, pound them into a powder, and add it to flour and stews.

Weapons

.22 Long Rifle—The Ultimate Subsistence Round

This is by far the most important weapon in the arsenal of any true survivalist or modern subsistence hunter. It is inexpensive, has no recoil, low noise, high accuracy at ranges under 50 yards, and the ammunition is lightweight, compact and VERY cheap.

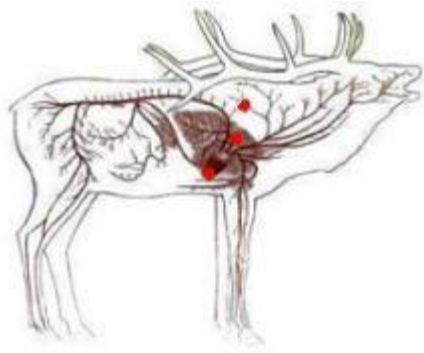
Although illegal in many jurisdictions for large game animals, the .22 rimfire has likely put more deer on the table than any other weapon. The rifle is often underestimated, derided as a “peashooter” and toy. While it does not have the kinetic “knock-down” power of faster centerfire loads, a single well-placed shot can easily kill a deer at 50 yards. The caliber of the bullet itself is actually almost the same as that for the AR-15 (.223). I am still unsure why it is illegal for deer—I doubt it is out of concern for humane kills, as the state of Texas just dropped the minimum weight limit for bows and also has no prohibitions against using the .22 for feral hogs, axis deer or javelinas. My hunch is that its silence and deadly accuracy make it the perfect tool for poachers, and this is the only reason that it is illegal for deer, which is a big money animal for the State.

.22 LR firearms come in a variety of shapes and sizes—everything from copies of popular assault rifles to single-shot pistols. I prefer bolt action for rifles, as the blowback operation of most semi-auto actions causes a reduction in accuracy and is prone to jamming. I have a Savage Mark II bolt action rifle with 10-round magazine, adjustable zoom scope and folding bipod. I’ve dropped feral sheep from 100 yards with this setup,

but prefer just bare-bones iron sights for hunting squirrels and rabbits at close range in dense brush. I also own a Smith & Wesson .22 A-1 semi-auto handgun, with which I hunt rabbits and dispatch larger trapped or wounded animals. I also recommend several other .22 caliber firearms. The Henry Survival Rifle (also called AR-7) which was designed as a survival hunting weapon for Air Force pilots, is semi-auto with a 10-round magazine, but the best part is that the entire thing can be easily disassembled and sealed in the water-proof hollow stock for easy transport. I also recommend the Rossi .22/.410 which has quickly interchangeable barrels, and the Springfield Armory M6 Scout which is also .22/.410, but in an over-under configuration. The .22 is perfect for small game and exotic nongame, while the .410 is legal for all game animals and can bring down deer with slugs or buckshot.

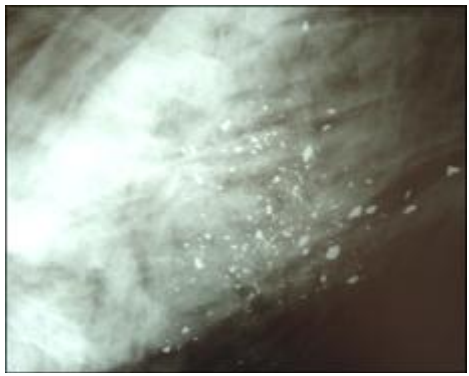
Javelina dropped on the spot with a single heart shot from a .22 at 50 yards

Because a .22 bullet has such a large drop (about 5” for 100 yards) it is important to sight in your scope at about 50 yards and know how to adjust it for longer or shorter shots. You will always have a “double zero” –two distances at which you will hit the bull’s-eye. This happens because the barrel is imperceptibly tilted up relative to the line of sight. The bullet arcs upwards and crosses the line of sight at 10 or 15 yards. Point blank, and you’ll be an inch low if the center of your scope is an inch above the barrel. For distances in between 10 and 40 yards or so, the point of impact will therefore be about an inch ABOVE the target. So, it is important to be able to apply “Kentucky windage” (aim an inch below what you want to hit) or know how to adjust your scope.



With such a low-powered round, ammunition selection and shot placement are critical. I prefer high-velocity loads (CCI or Winchester) for all applications, hollow-point for heart, spine and lung shots, and solid point for headshots. I NEVER aim for the shoulder when hunting medium to large-sized game with a .22, but just behind it and low in the chest just above the “elbow”. A direct shot to the heart with a .22 will often drop an animal on the spot, as will a shot in the head or spine. I often go for the double lung shot, and the animal usually drops in 10 to 40 yards. I have never lost a large animal shot this way. Shooting for the head or spine is very risky, as they are very small moving targets. Do not attempt these shots unless you are at very close range, the animal is absolutely still, there is no breeze and you are an expert marksman.

Even when using a high-powered rifle or shotgun, I would recommend not taking shoulder shots. Although shoulder shots will drop the animal on the spot, you are going to have to cut away much more bloodshot meat (particularly with high-powered bullets, whose shockwaves carve out massive wound channels) Its not that bruised, bloodied meat isn’t good to eat, but that when a rifle is used, the bullet fragments into hundreds of toxic lead shards and particles that can penetrate half a dozen inches or more away in all directions from the wound channel. Placing a shot *behind* the shoulder will result only in the loss of a few inches of rib and lung.



X-ray showing lead fragments in meat, which show up as bright specks.

Slingshots, Blowguns, Airguns and Bows

These are often the weapons that young folks gain their early experience and make their first kill with. They are also advantageous due to being almost completely silent. In addition, their use may be permitted in areas where hunting with firearms is not, such as within city limits.

Slingshots come in two main forms—a small pouch connected to two long strings that are twirled by hand, and the more familiar "Y" with a pouch attached via two rubber tubes or other elastic material. The latter is much easier to use and aim, and can take down rabbits with stones or metal shot.

Blowguns can be purchased or cheaply made from PVC pipe. Darts can be tipped with sharpened nails or small razor blades for killing squirrels, rabbits and even possums, or blunted for knocking lizards and birds out of trees.

Airguns should be used in conjunction with pellets rather than BB's for most hunting. The most common are .177 caliber and travel at 650 ft./sec, but some also are made for 10 to 30 grain .22 pellets that can approach velocities of 1,000 ft/sec. (For comparison, a 32 grain CCI .22 LR round

travels at 1640 ft/sec). The .22 version is considered a true “varmint” gun and can be used to take animals the size of raccoons. There are even airguns in .50 cal that have been used to kill bison! There are a number of ways these guns compress the air—springs, attached pumps, CO2 cartridges, and even scuba tanks! I prefer ones that can be pumped multiple times.

While bow-making is beyond the scope of this book, (already some excellent books on the topic) the use of a long, recurved or compound bow will allow the subsistence hunter greater opportunities during seasons and on lands that permit only bows. The modern compound bow is a very compact and versatile weapon. The unique rolling of the cams allows one to draw back the bow and hold it for some time without fatigue. They are often equipped with glowing sights that allow them to be accurately aimed in all light conditions without the hours of practice required to instinctively aim a traditional bow at various ranges. Bows can also be outfitted with reels with lines attached to longer, barbed arrows and used to take non-game fish.

Hunting Techniques

Predators use two primary methods of attack: cats tend to employ stealth to ambush, and dogs tend to run down their prey until they are exhausted or work cooperatively to herd and drive them to their waiting teammates.

Stalking

Most game animals rely on scent and sound as their primary means of detection. Humans and primates have superb color, binocular 3-D vision, but most other animals see fewer hues and have eyes located on the sides of their heads to give them a wider field of view, at the expense of depth perception. Many can sense movement off in the distance far better than we can, but if your outline is broken up by camouflage, and you stay perfectly still, you are as good as invisible.

Scent is far more developed a sense in most animals than it is in humans.

During the day, many prey species go the uplands where the rising hot air will alert them to the scent of a predator. During the night, they head for the valleys as the cold air descends. Take great care to avoid sweating, using perfume, scented soap or shampoo. When not wearing your hunting clothes, leave them outside. Rub dirt and mud on them. Wood-smoke is also surprisingly good at disguising human scent. You can train your own nose to aid in the hunt--some Amazonian children can detect a monkey high in the canopy by the smell of their urine! We have the power to detect animals by smell, but the scents often do not register in our brains because we do not connect them with anything important. After you kill a few animals, you will begin to recognize their scents. Smell the bare ground of scrapes and the branches above where deer rub their scent glands. Smell trees that have been clawed or marked. I can detect deer, javelinas and porcupines if I'm downwind before I see or hear them!

Cats move slowly and deliberately through their environment, stopping at short intervals to listen for tiny sounds and do a quick scan. Like a cat, pause every so often so that you create absolutely no sound and can listen for the smallest rustle of leaves or an animal call in the distance. When a cat spots its quarry, it goes into stalk mode--lying flat against the ground, inching forward and covering more ground when the prey animal is distracted.

Sound camouflage is often not considered by many hunters. Whenever there is a loud noise--a sudden burst of wind, a passing airplane, other animals moving or vocalizing, use these moments to rapidly close some distance without as much concern for making noise. You can also disguise the sound of your own footsteps by making them sound like those of the quarry. Listen to the sound a deer makes when it walks, and imitate that sound when you walk. During times of heavy wind, rain or fog it is especially easy to approach animals as they are unable to see, hear or smell you if you come from downwind. When you spot the animal, crouch down as low as possible, moving on all fours or your stomach if necessary. Even if you are spotted at this point, a crouching human is much less threatening than a standing one. If the animal looks up or turns your way,

FREEZE! Wait a few seconds and it will often resume its activity. Finally, when you have a good shot, TAKE IT! Don't wait--"hesitation kills" or in this case, will cause you to go home hungry.

Flushing & Driving

Rather than rely on stealth, pack hunters like wild dogs often move in blitzkrieg fashion and increase their chances of running into prey by covering a lot of ground very quickly. The Coahuilteco and Mbuti in the Congo also hunted in such a way, but often in conjunction with nets. Each family would own a net up to several hundred yards long, and they would link these nets together at the point of a natural funnel or choke point in the landscape. If the landscape was open, such as in the Arctic, hunters would erect stone cairns or walls. Entire families participated in these drives, hitting the brush with sticks, waving hides, setting fires, screaming and generally just making a lot of commotion. The game would panic and stampede towards the chokepoint, net or cliff where others would be lying in wait for ambush or to deliver the final blow to wounded animals. It is important that the drivers stay apart in an arc shape and do not bunch up; otherwise, the animals may escape from the sides rather than flee straight ahead. If you do a drive in conjunction with projectile weapons, make sure that everyone knows where everyone else is, and establish a zone of fire and stick to it so that no one is accidently shot.

Still hunting

A fancy expensive blind is not necessary. Lie flat on the ground in tall grass or in dense brush, but in such a way that you will have a shot when the animal passes by. Sitting high in trees is also very effective, as few animals (or people) look up. A seat can be as simple as a few logs laid horizontally across some tree branches, a woven branch platform, or a chair securely lashed to the trunk.

My simple deer stand—a chair securely lashed high in a tree to a few poles, with an extra pole for a foot rest.

Whatever you use, make sure that you are comfortable as possible as you will have to sit motionless for some time. Choose a location near a source of water or food, preferably near a well-used trail. Many animals are active right around sunrise or sunset, and it is important that you get up in position an hour or so before you expect them to arrive. It's a good idea to put up a game camera on the trail so that you are not waiting there morning after morning when in fact it’s only being used at 10:30 at night (this has happened to me!). You can also put out baits to draw the animals to your location, or you can call them in.

Trapping

- *Fur-bearing animals may be legally taken with firearms, foothold, conibear style, live or box traps, dogs, snares, lawful archery equipment, electronic or hand-held calls, artificial light, or by falconry*
- **Traps** *may not be used to hunt game birds or game animals.*
- ***Trapping*** *may be used for nongame/exotic animals (e.g., feral hogs, rabbits, etc.) on private property.*
- *Traps set on public land must have a tag attached with the trapper's license number and name or address.*

It is illegal to:

- *Shoot at, take or attempt to take any fur-bearing animal from a boat on public waters in Texas.*
- *Take fur-bearing animals with a foothold or conibear-style trap except during the season for commercial harvest.*
- *Take fur-bearing animals with traps unless such devices are examined at least once every 36 hours and animals are removed on discovery.*
- *Take fur-bearing animals with a foothold or conibear-style trap within 400 yards of any school.*

Traps should be set in areas that show signs of recent activity of target animals (trails, tracks, scat, fur, scent marking areas, scrapes, etc.). You wouldn't put a convenience store miles away from a road and you can't expect to just set a trap in a random location and expect to be successful! Stream banks, dry washes, canyons, and choke points are animal superhighways, but there's plenty of other promising locations—brush piles, abandoned structures, hollow trees, etc. --just check for sign before you set so you're not waiting months for a random passerby! If trapping fenceline, look for bits of hair in barbed wire to identify quarry, and check dirt/leaves at the spot where the animal is passing under—if it is fine, soft or loose, it probably has been used recently.

When metal traps are first purchased, they are shiny and oily. It is important to change their color and remove any human scent to maximize their effectiveness and protect them from the elements. Boil the traps to remove grease and hang outdoors until they acquire a light coating of rust. Next, boil them with walnut or pecan husks or artificial trap dyes. Melt some wax on the surface of the water and slowly pull the trap out of the water. Its really only necessary to wax foothold traps, which are sometimes buried for weeks at a time. Waxing conibears makes them not only dangerous to set, but can cause them to become too sensitive and spring before the animal is fully in the trap. Wire snares require only boiling, no need to wax or dye.

If you are trapping for fur, trap only during the coldest winter months when the animals develop thick undercoats and the skin thickens. During warmer times, the skin is often so thin that the hair roots will pull through when fleshing. For this reason, most pelts taken in central Texas fetch a

low price on the fur market or cannot be sold at all. I still tan pelts of critters that are subprime, but for personal use only.

#110, #160 and #220 Conibear Body Grip/Kill Traps

Conibear

Also known as body-grip and killer traps, these are like giant, vertical, 2-way mousetraps and are designed to kill any animal that attempts to pass through by snapping on the neck and ribcage. They require more time to set up than snare or footholds, but are much more effective, especially when used with baited cubby sets. Build a small, covered "cubby" by piling up rocks, wood, or brush to form 3 walls and a roof.

Improvisation: 2 very large rocks were already in place. I added the one on the left and ran the springs through a branch which is anchored against a natural depression in the rock on one side and by a stake on the other.
Below: *The weight of the big rock on the stick firmly anchors the trap in place while still allowing it to snap shut with lightning speed. The cubby is set up so that the springs will not hit anything when they open. The small rocks on the sides block any other openings. This setup took about 5 minutes.*

You can also dig a hole into a bank, build a wooden box, or use plastic buckets as cubbies. Place the bait as far back in the cubby as possible—when I first started trapping I placed the bait too near the entrance, and

had several sprung, empty traps—the coons were just reaching in and grabbing the bait, brushing the trigger as they quickly pulled out! Set the trap and stake at entrance through the rings on the springs. You can stake each ring separately into the ground, or bend the springs up and run a single branch through both and over the box. Just make sure the trap will have enough clearance when it springs. It is very important the trap is well stabilized, so that the animal moves the trigger wires rather than knocking the whole trap over. Wire the trap to a stake, tree or heavy log. Finally (and DON'T forget this part!) remove the safety latches on both springs.

#160 Conibear trigger wires bent out for the largest animals that can pass through the trap—coon, fox, possum.

Prior to setting, make sure to bend out the trigger wires in an upside-down "Y" shape. Adjust them so that the shoulders of the target species will brush against them as they pass through.

After compressing springs, engage safety latches before setting trap. Make sure to carefully unlatch when finished setting!

#110 with dog notch set on most sensitive setting.

The lever at the top has three notches. The one closest to the trap is the strongest, used for larger animals. The one furthest away is the lightest, but requires more trigger travel before springing, meaning the smaller animal will be further in the trap before it springs. You can also bend the wire forward and attach cardboard or wood paddles to them so as to target even smaller animals or snakes.

I use #160 primarily for skunk, ringtail, possum, coon and fox, though #220 are better for the latter two. You can also find them in larger and smaller sizes.

A big problem with conibears is trying to exclude animals that you don't want to catch. Choose the right bait for the target species, make the cubby entrance small to exclude larger animals, bend the triggers wires out and use the strongest setting to keep from catching smaller animals (usually skunks). It's better to just re-bait a trap than have to deal with a skunk that you don't want. Personally, I like catching skunks, but my relatives and friends aren't enthusiastic about it to say the least!

I trap in pretty remote areas, but if you are trapping anywhere where dogs, cats or children frequent, DO NOT use conibears!

While #160 and smaller conibears can easily be set by hand alone, a specialized setting tool makes removal of the trap from the animal much easier. They can be purchased inexpensively at Bass Pro or online, or you can make your own.

A morning's catch. Note that the fox was not all the way in the trap, whereas the skunk is properly trapped. The bobcat was caught with a snare

Foothold

Footholds consist of a frame, trigger pan, jaws and either one or two long springs, or two coil springs with attached levers. Coil spring traps are more compact and stronger, but more expensive.

When setting on a trail, offset the trap to one side. Dig the hole wide enough so that springs and jaws can move freely, and deep enough so that the pad will be almost flush with the surface. To set the trap, step on the springs or spring levers, open the jaws flat, fold the dog over one jaw and secure it in place by raising the pan to engage the notch. Place the set trap in the hole.

Unconventional, but a thin covering of grass works in a pinch. I've caught several raccoons with this setup. Just make sure that the layer of grass is very thin and doesn't get in the way of the jaws.

After sprinkling some soil over the grass, the trap is perfectly hidden.

SPRUNG! As you can see, the thin layer of grass and dirt is only superficial.

Stake the trap into the ground through the swivel, or wire it to a drag log or unsecured grappling-hook type anchor via the swivel (which allows the animal to exhaust itself by dragging through the brush rather than actually pulling or chewing out of the trap). Place a round piece of cardboard or sturdy plastic under the trap pan, or place grass over it. Carefully push dirt to the outer edge of the jaws. I sometimes line the outer edge with pebbles or dirt clods to prevent too much dirt getting underneath the pan. Sprinkle or sift fine dirt over the whole trap so that the pan and jaws are covered. Make sure that no bits of grass, twigs, or other debris will interfere with the jaws closing. Finally, you may want to place a small thorny twig or a line of small stones on either side of the trap so that the animal must lift his paw at exactly that point and step onto the buried pad.

Trap sensitivity and pan tilt should be adjusted prior to use. There are 3 possible adjustments: file notch down (raises pan, increases sensitivity), file dog down (raises pan, increases sensitivity) and bend the frame to which the dog is attached (in lowers pan, out raises it) The pan should be level when the trap is set, and it should not spring until the weight of the target species presses down on it.

An old longspring in need of serious trigger adjustment

Footholds can also be placed in the water for coons, into chopped-out notches on leaning logs, buried near carcasses or at the entrances of cubbies, or placed in the bottoms of trashcans.

Wire Snare

These are one of the simplest traps to make and set. They can be purchased at local farm & ranch supply stores or easily made from cheap, readily available materials.

Swivels prevent the wire snare from being unraveled by a trapped animal.

Commercially made snare lock.

Obtain some twisted steel wire (such as used for aircraft cable or for hanging frames), quarter-sized washers and some heavy duty fishing swivels and ferules (metal sleeves) which are used for leaders. Drill two holes opposite each other on the sides of the washer—they should just be big enough so that the wire can slide through easily. Clamp the tip of the washer in a vice grip with the holes aligned vertically, and hit the top of the washer with a hammer until it starts to bend over. Remove the washer and widen the vice grip. Place the bent washer all the way down in the vice grip so that it looks something like:]^[. Tighten vice grip until the washer bends almost flat. It should be lopsided, with one of the drilled holes aligned with the central washer hole. Hold the washer so that the aligned holes are up, and the other drilled hole is down. Run the cable through the lower hole, fold over the tip, and slide the ferule down wire. Insert a short length of the end and clamp tight with pliers or a special crimping tool. Run the other end through the central hole and upper drilled hole. Place another ferule on the wire, run the wire through the swivel ring, bend over, insert into the ferule and crimp. You now have made a locking wire snare!

My homemade rabbit snares with washer locks

To set a snare under a fenceline, adjust the noose to size for the target animal, making it slightly larger than its head. Cut about 1” of wire, bend into a “U” shape, and use to clamp snare to the lowest fence wire, just behind the washer and on the side facing the swivel. Align the snare so that it sits vertically. Cut another length of wire about 5” long, double over, run it through the swivel and around fence, then twist with a pair of pliers several times. Cut a small piece of aluminum or copper wire about 1 to 2” long, fold it in half and curl the ends upwards with a pair of pliers. Use this to clip the upper center snare wire to the fence.

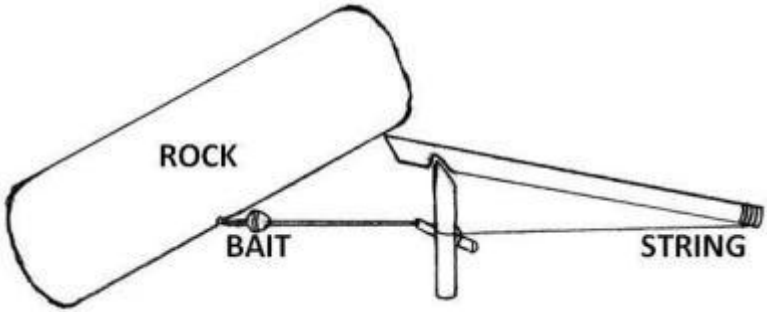
Finally, place rocks or brush on either side of the snare so that the animal is forced through it. As the animal passes through, its shoulders will catch on the snare, which will pull away from the copper/aluminum clip and drop onto the animal's neck. The snare will constrict completely and pull away from the second clip. If the animal continues to struggle, the snare will tighten further causing strangulation. Sometimes if the snare wire is long, the animal will climb over brush or through the fence and hang itself. If the noose it too large, animals may be caught around the midsection or occasionally around the hind leg.

To set a snare without a fenceline, you can drive 2 “Y” shaped sticks into the ground, place another stick across the tops and attach the snare to this as with the fence. You can also use spider webs, thin pieces of grass, or twigs split at the tips to clamp the snare in place in lieu of a copper clip. Wherever you decide to set the snare, it’s a good idea to pile thorn brush, rocks or other debris on either side of the trail to funnel and force the animal to go through the snare.

I have also used trotline and heavy monofilament for snares, but they should only be used with very small animals that cannot chew through, or in conjunction with spring sets that will kill quickly. Use a slipknot or lariat-style knot in place of a metal locking device.

In 2010, a friend and I spent 5 days camped on a lake island deep in the Lacandon jungle in Chiapas, Mexico. We woke to the roaring of howler monkeys and spent the days fishing and collecting mussels, but every night we saw beady little eyes prowling around camp. I set a spring snare from monofilament baited with a mussel, but had no idea what I was after, so attached 3 snares together. On The last night we heard the whoosh of the spring and found a Grey 4-eyed possum caught by the leg—one of the tastiest critters I’ve ever eaten!

Deadfalls



A large weight (flat stone, log, etc) is raised and held in place by a sensitive trigger. When sprung, the weight falls on the animal, ideally killing it instantly.

Choose a weight that is a little wider and longer than the target animal, and 20 to 40 times its weight. If you use a lighter rock, the animal may have enough life left to dig or wriggle out. Rocks should be VERY flat and traps should be set on a hard flat surface.

The two most common triggers are the figure-4 and Paiute. Figure-4 is easiest to make and set up, but the Paiute is much more sensitive.

To make a Paiute, cut a short stick to length so that it will prop up a rock at a 45 degree angle or less. Carve one end of the stick until it is like a flathead screwdriver. This will be the top. Take another stick 2 to 4 times as long. Score one end and tie a string here. On the same side, but opposite end from the hanging string, cut a notch that will fit onto the bladelike top of the first stick. Now, split a small stick in two to create a

flat side. Score it in the middle and tie the other end of the string to this. Have someone hold up the rock for you. Hold the first stick vertically and hold the long stick on it via the notch. Slowly lower the rock. Wrap the short tied stick 180 degrees around the first stick, with the flat side pointed towards the rock. Take a long, thin, stiff twig, and place one end against the flat side of the short, tied stick and the other wedged against the rough surface of the rock. This is the bait stick. You may need to break it with your teeth to get a perfect fit. Tip: If the string wants to slip on the vertical stick, rough it up or cut some shallow grooves in it.

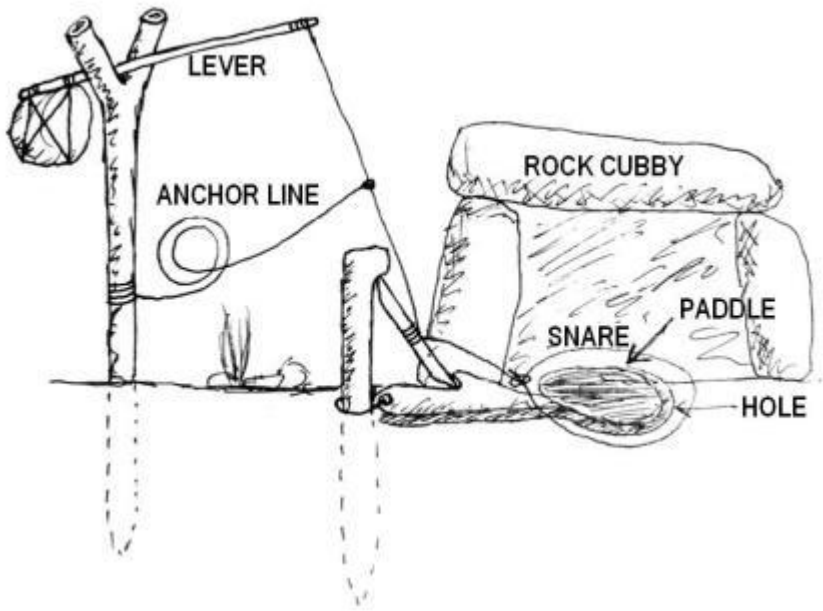
These traps can be scaled up for very large game, but can be very dangerous. A rancher I know set one for a predator and ended up killing several baby goats that took refuge beneath it for shade!

On my first survival trip, a friend and I trekked 90 miles through the Frank Church Wilderness of Idaho for 6 days with just sleeping bags, knives and a pound of flour. We felt something tugging on our bags one night while sleeping in a cave and saw packrats ripping chunks out to add to their nest. We had only eaten a ground squirrel, snake and ants for protein, and set up a deadfall for the first time. The next night, we woke when it sprung, excited! But NOTHING! Next night, same thing. Finally we dug into their huge stick nest—they jumped out like popcorn but were too fast! On the last night we stayed outside an abandoned cabin and finally caught a single mouse with a deadfall which we shared. Lesson: animals are VERY tough—always use a BIG rock!

Improvised Triggers

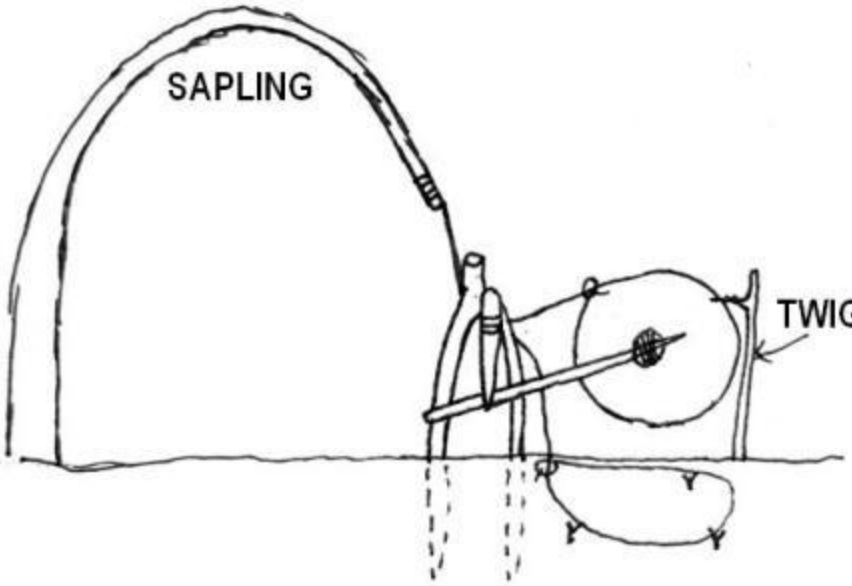
Because conibears and footholds are only permitted during trapping season, one must come up with ways to utilize snares more effectively. Providing a source of power for the snare and a trigger can vastly improve the capture rate. The power source can be a bent sapling, counterweight on a long lever or pulley, bungee or rubber cord, spring, PVC pipe, etc. It is important that it pull far enough to completely tighten the noose,

sometimes lift the animal above the ground, and sometimes with enough force to break the animal's neck.



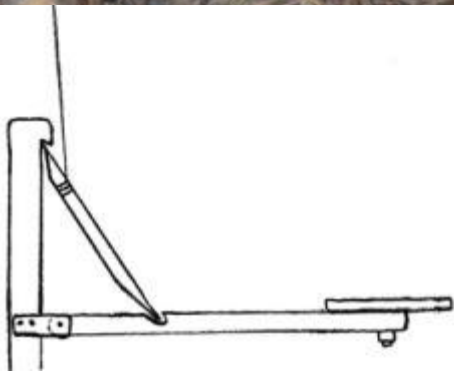
If you make a gravity lever setup like this, make the lever over 6 feet long (like a fishing pole) and pull it down all the way to the trap trigger for maximum pull. If you want to pull the animal off the ground, make sure the lever is heavy duty and run the anchor line to it instead of a stake.

The simplest trigger is an upside-down “Y” or “U” shaped stick or piece of metal driven into the ground or tied to a large rock. The power source is attached to a small stick by a string, and the small stick is pull under the “Y”, and held in place by a longer stick that passes under its tip and sits against both sides of the “Y”. The longer stick either can have bait tied to one end, or have sticks leaning against it so that it is triggered when the animal steps on those sticks.

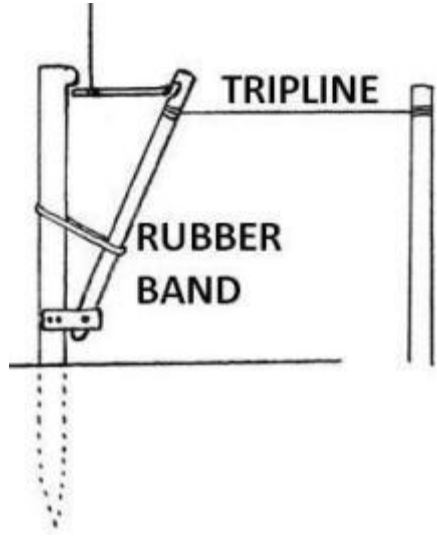


Thinks LEVERS! A long lever must move a lot, but will allow a small force to trigger a trap. The most sensitive trap triggers incorporate two levers to form a hair trigger, so that a small force AND a small amount of movement trigger the trap.

Brainstorm! Improvise!



My favorite trigger is a simple stake to which a swinging horizontal stick is attached perpendicularly at ground level. This stick has a notch on the upper side close to the stake, and a paddle on the far end. The snare is attached via a small stick that is held in place by a notch at the top of the stake and the notch on the swinging stick. A hole is dug beneath that stick to allow it and the paddle to move downward a few inches. When the paddle is depressed, the little stick is released.



To make an effective tripline trigger, make a setup as above, but orient the swinging stick at a steep diagonal angle relative to the stake, and carve a notch on the inner tip in place of the paddle. The swinging stick is pulled towards the stake at the top by either a rubber band or springy stick attached to a loop. The trigger weight can then be precisely adjusted by moving the loop/band up or down the swinging stick. To set the trap, wedge the small stick between the stake and swinging stick notches, and run a trip line from the swinging stick to a nearby tree or additional stake.

Dispatch

When an animal is caught in a live-catch trap such as a foothold or snare, he immediately panics and attempts to escape. After struggling for a bit, he is worn out and lays down to rest. When the sun begins to come up, he will begin desperately trying to escape, tugging and pulling, perhaps even chewing off his own foot. The more time spent in the trap, the more likely this becomes. I therefore try to check my traps early EVERY morning just before or right as the sun rises. You may want to carry a pole with a non-locking noose on one end if you intend to release unharmed animals that you would rather not keep.

If you are trapping for meat alone, the quickest ways to dispatch an animal are to either hit it on the head with a hefty club or shoot it just behind the eyes with a .22. If you go with the club, don't just tap it, smack it as hard as you can—it's surprising how tough animals are. Don't mess around with attempting to club bobcats and coyotes—just shoot them. Avoiding a small hole in a pelt is not worth having to go in for rabies shots.

If you want to save the skull and skin for sale, it is important that you cause as little damage to them as possible, but still manage to kill the animal quickly and without risk to yourself. Again, you can use a .22, but this time shoot behind the skull where it attaches to the first vertebrae. The animal may go into a spasm and die seconds later, as this severs the nerves that lead to the heart and lungs. A more risky, but less damaging way is to club the animal on the spine, and then step on the chest just behind the shoulder, compressing the lungs and stopping the heart. Don't let up until all movement has stopped, and even then give it a few minutes just to make sure before you handle the animal.

If an animal is already dead in the trap, he will often still be good to eat even though his body may have gone stiff. If you are worried, but it has not begun to smell too bad, cook the heck out of it in an earth oven over night and it should be fine! Depending on temperature, animals will begin to spoil within about 6 to 20 hours. Their guts become bloated, the skin around the stomach begins to turn a bluish green, and the hair starts to fall out. Predators tend to decompose much more quickly than rabbits or

deer. I found a bobcat that had been dead in a snare for no more than 8 hours on an unusually warm night—already bloated and smelling. The hair fell out in big handfuls when I went to flesh the hide, but at least I was able to save the skull.

Diseases

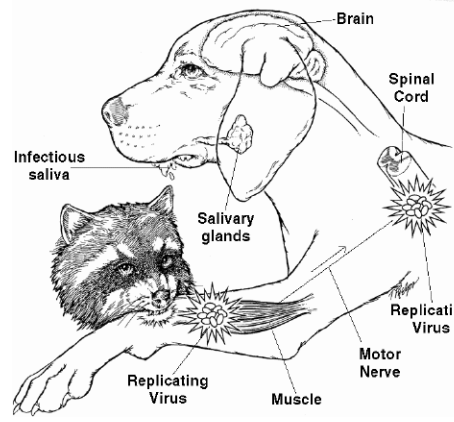
Although contracting many of the following diseases is extremely rare, the subsistence hunter has a heightened risk for exposure to certain infectious diseases and food-born pathogens and should be aware of these and take preventative measures such as wearing gloves whenever handling carcasses and raw meat, and cooking questionable meat thoroughly. This list is by no means exhaustive.

Trichinosis: This disease is caused by ingesting undercooked or raw meat of an animal that has been infected with *Trichinella spiralis*, a kind of roundworm. This worm reproduces within the intestines of the host, and the young worms enter the bloodstream, travel throughout the body and form cysts in other tissues. It is primarily transmitted from predators and hogs, as flesh containing cysts must be consumed for it to spread.

Symptoms include nausea, diarrhea, swelling of the eyelids, bleeding around the fingernails, fever, muscle pain and eventually paralysis if the worms enter nervous tissue or the brain. Infection is treated with anthelmintics, drugs which stun or kill worms. All meat taken from hogs and predators should be cooked at temperatures higher than 170 degrees F, which will kill the worms.

Tularemia: Commonly known as "rabbit fever", this infection with *Francisella tularensis* bacteria causes lymph nodes to swell, induces a fever and more rarely skin lesions and rash. It is primarily carried by rodents, rabbits and feral hogs and can be transmitted though bites of flies, fleas or ticks, direct contact with body fluids, inhalation of aerosolized droppings, consumption of undercooked meat, and is also used as a biological weapon. It is easily treated with antibiotics and recovery often confers long-lasting immunity.

While the rate of infection is extremely low among the general population, rabbit hunters have a greatly increased risk. A friend contracted it while skinning rabbits on a daily basis to feed to his bobcat. I have heard anecdotal evidence that rabbits are more likely to be carrying it during the summer months, I presume because winter would put more stress on the immune systems of infected rabbits, causing them to die more quickly. I still hunt rabbits throughout the year, but exercise more caution in the summer. White spots on the liver may indicate tularemia, and I am more cautious in general with any animal that has a blotchy liver (skunks are often spotted yellow).

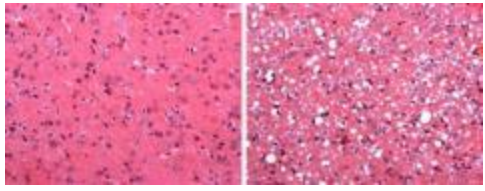


Rabies: This lethal disease is caused by a virus that attacks the nerves and brain. The virus is primarily transmitted through bites (it is concentrated in the saliva) and more rarely through contact with infected brain or nervous tissue. In order for the

virus to spread through the body, it must make contact with nervous tissue within a given amount of time. It is extremely rare (though not impossible) to contract from consuming meat—but thorough cooking as well as COMPLETE desiccation (drying) destroys the virus.

It is impossible to tell if an animal has rabies just by looking at it—samples of saliva, brain or spine must be sent to a lab for testing. If you suspect that you have been exposed to rabies, immediately go in for a vaccination, which has been 100% effective in the USA for preventing contraction. Once you show signs of the disease (muscle spasms, irritability, paralysis, difficulty swallowing, coma) there is no known cure. Survival is almost unheard of, and the handful of people that have "recovered" do so with severe, permanent brain damage and motor skills impairment.

Although any mammal can contract rabies, its primary vectors are raccoons, skunks, foxes and coyotes and bats. Because these animals are carnivores, their frequent contact with other animals allows them to spread the disease before they die, whereas animals such as squirrels would likely die from the attack by the rabies-carrying predator and not even have a chance to contract the disease. If you have pets and are a trapper, it is a good idea to have them vaccinated. Preventative vaccinations are also available for humans.



Prions: Commonly known as "Mad Cow Disease," conditions such as bovine spongiform encephalopathy (BSE), Scrapie, and chronic wasting disease (CWD) are all caused by bizarre pathogens that are not even viruses, but rather simple misfolded proteins that invade cells and convert normal proteins into more prions which then replicate. Prion infection results in a brain that looks like it has been riddled with tiny holes, like a sponge, and is 100% lethal with no known vaccination or cure.

Because of the long period of time between infection and manifestation of these diseases (often years), whether or not some of these (Particularly CWD) are transmissible to humans is unclear. The most common human forms are known as Creutzfeldt-Jakob disease and kuru (famous for being transmitted by cannibalistic consumption of brains in Irian Jaya and Papua New Guinea).

Unlike all other disease pathogens, prions cannot be destroyed by ordinary cooking, and must be exposed to temperatures in excess of 1,000 degrees F or a combination of lower temperatures and extremely high pressure. Fortunately however, these diseases are EXTREMLY rare in Texas. I've eaten hundreds of brains and I'm still alive and kicking!

E. Coli: *Escherichia coli* is an important symbiotic (beneficial!) bacterium normally found in the lower digestive tracks of both humans and animals, killing other bacteria and aiding in digestion. However, when it gets somewhere it shouldn't, it can cause sickness, commonly known as "food poisoning". It comes in dozens of strains, most of which are harmless, but some of which can manufacture potentially lethal toxins.

Transmission occurs primarily by eating or drinking from sources contaminated by feces, which is why we try to avoid gut-shooting animals or puncturing the lower intestine during processing. However, should some intestinal material or feces make contact with the meat, it is still safe to eat if cooked all the way through at 160 degrees F.

Bloody diarrhea, stomach cramps, nausea and vomiting are the primary symptoms. An infection may be treated with antibiotics, although many strains have developed powerful resistance to medication. The sickness will often go away on its own after a few days, but it helps to rest and drink plenty of water to replace the liquid lost by heavy diarrhea. I have had E. Coli infections a few times (drinking untreated water and eating raw meat) and felt pretty miserable for a couple of days, but everything cleared up on its own. I think the news hype about E. coli is overblown and that the sickness is only particularly dangerous to the old and young and those with compromised immune systems.

Anthrax: An infection caused by the *Bacillus anthracis* bacterium, which is generally transmitted via sheep, cattle and goats to people who frequently work with their skins or wool. The bacteria are sometimes present in the soil and can persist for years—several cases have been reported for deer in Texas. It is also well-known for its use as a biological weapon. It infects via contact with spores: through the skin (cutaneous), digestive system (gastrointestinal) by consumption of undercooked meat, or lungs (respiratory) via inhalation. Symptoms begin once the anthrax spores germinate and produce toxins that cause sores, weakness, fever, vomiting, and diarrhea.

Anthrax infection should be treated immediately with antibiotics. If it enters the bloodstream, it is often fatal. Vaccines are also available. Prevention involves avoiding sick-looking animals, thoroughly cooking questionable animals and disposing of their skins. During the winter months, lack of food and cold weather result in quicker deaths of infected animals, so by hunting during these seasons, ones risk is greatly reduced.

Leprosy: Also known as Hansen's disease, this condition is caused by infection from *Mycobacterium leprae* bacteria. It can have a very long incubation period and when it does manifest, forms sores on the skin and causes muscle weakness and numbness. Severe disfigurement occurs over time as the lack of feeling allows the infected individual to injure themselves or ignore wounds and secondary infections, which progressively are not given a chance to heal.

Cases of human leprosy are extremely rare in the United States, but armadillos are a carrier, with up to 20% infection rates. Fortunately, the

majority of humans of immune to the disease, and it is also easily prevented by wearing gloves when cleaning armadillos and thoroughly cooking them.

Botulism: Subsistence hunters have a higher risk for this rare but serious illness, as it is caused by neurotoxin released by the *Clostridium botulinum* bacterium when it is deprived of oxygen within improperly, canned, dried or fermented foods (it can also be found in honey). Interestingly, the toxin blocks nerve receptors in a way similar to that in which the Texas hallucinogen datura does, which can also cause death by respiratory paralysis.

Symptoms include: abdominal pain, difficulty breathing, swallowing and speaking, weakness, dry mouth, double vision, drooping eyelids and paralysis. Treatment consists of administration of botulinus antitoxin and use of a ventilator and feeding tube for more severe cases.

Prevention is simple: heating all preserved food to 250 degrees F for 3 minutes prior to consumption destroys both the spores and the toxin.

Hantavirus Pulmonary Syndrome: This rare viral disease is carried primarily by wild mice and found in their feces and urine, but does not harm them. However, it is extremely dangerous for humans who acquire it by inhalation—up to 50% of cases are lethal, even with treatment (which is mostly limited to administration of oxygen). It can also be transmitted by bites or direct contact with rodent body fluids. Symptoms include chills, fever, headache, nausea, low blood pressure, cough and rapid onset of breathing failure. Hantavirus has also been used in biological weapons programs.

Prevention is by avoiding areas that contain rat and mouse droppings, wearing gloves when handling, and thoroughly cooking rodents.

Botfly: Also know as screwworms and warble flies. While not a disease or real danger to humans in Texas, I often find these huge parasitic fly larvae just beneath the skin above the hind legs of a good percentage of the jackrabbits I catch. The adult flies lay the eggs on the fur, and the maggots burrow under the skin where they feed voraciously on surrounding tissue, creating large bloody bruises on muscle and skin. When fully grown, the larvae squeeze out through their breathing holes in the skin, fall into the ground and pupate. The wounds can become infected, but rarely do as this sometimes kills the host along with the larvae.

Some botflies will actually capture mosquitoes and lay eggs on them, which the mosquitoes then transfer to the host! In the Arctic, caribou botfly larvae are colloquially referred to as “mushrooms” and consumed with gusto!

Processing

Gutting & Skinning

There’s a saying that there’s “more than one way to skin a cat”. Everyone refines their own techniques, but the following are the primary methods I use. However, there are times when I must improvise—such as when in the Chihuahuan Desert and having no trees to hang an animal from, or when I killed a heavy ram in the bottom of a canyon and it was too heavy to even move from between the boulders where it fell.

Butchering a feral ram in the bottom of a canyon

Use a small, extremely sharp knife to make the initial incisions. I like to use a #11 X-Acto knife for smaller game—comes in real handy when doing detailed work around the eyelids and lips. Don't try to skin an animal with a Bowie knife—they are alright for hacking off ribs, but for everything else are FAR too large and unwieldy, and its just too easy to slip and either ruin the skin or give yourself a nasty gash. Some people like to cut the throat and hang the animal to drain before butchering, but I prefer to skin and completely process the animal immediately if possible, as the skin is more easily removed while the body is still warm and flexible. If anything, I will cut the throat after skinning just to quickly drain the blood that has pooled in the chest cavity so it won't make too much mess when its time to remove the ribs and head. Save the blood and add to sausage or stew, as it is highly nutritious.

Large game (deer, hog): With the animal on the ground, cut from the base of the ribcage to the genitals. DO NOT cut through the abdominal muscle yet if you can help it! To avoid doing this, I insert the blade into the skin and push the knife away from me with the edge facing UP. Don't force it though—the knife could slip and you could stab yourself!

Peel the skin back a few inches on either side of the incision—this will start the separation between the skin and muscle and will really help once you go to skin the animal.

Now, cut through the abdominal muscle, exposing the guts but not puncturing them. Make a deep cut all the way around the anus, or insert a barbed stick into it, pull out a length of intestine, and cut off. Cut through the upper diaphragm (a thin, flat muscle that separates the lungs from the stomach) reach way up into the cavity and cut through the esophagus and trachea. Pull the lungs and heart out and cut the rest of the diaphragm away, bringing with it the liver and stomach. Keep rolling the guts out, cutting the connective tissue along the back if necessary, and remove the kidneys. Now you have a big pile of guts removed, which most people just throw away. Place aside the heart, lungs, liver and kidneys—these are some of the tastiest portions and rich in nutrients. Cut the stomach away from the small intestine, cut it open lengthwise, turn it inside out and remove the contents. It can be washed out later and cut into small pieces to make *menudo*, a very tasty stew prized in south Texas. The intestines of larger animals can also be saved—cut into several lengths and wash out thoroughly.

Cut through the skin all the way around the ankles just above the hooves. Cut from here down the back of the hind legs to the anus, and from the front legs across the chest. Peel the skin on the hind legs back until you expose the ankle tendon. Place on gambrel or run rope behind tendons and hoist high enough so that you can work comfortably.

Grasp the skin firmly and pull down—don't worry, the skin will not rip. With the skin tight, work your fist between the skin and muscle and repeat. Deer will be fairly easy, but hogs will require some cutting. Pull the skin tight, and make quick, light cuts through the membranous white connective tissue. If you are planning to save the head skin for tanning, see below. If not, you can now roughly skin the head without having to be concerned about detailed eyelid/gum removal.

A completely butchered javelina, all done on bedrock in west Texas

Case Skinning (used for all small game)

Make an incision starting at the back of the ankle and cut all the way down to between the tail and anus. Try to avoid cutting into any muscle. Most animals have different colors and lengths of fur on the outer and inner parts of their legs, and you should try to use this divide as your guideline. Repeat on the other leg so that both cuts meet. Cut all the way around the anus. Now, you have to decide if you want to leave the claws attached. If not, cut all the way around each ankle. Work your thumbs between the muscle and skin and pull over the ankle tendon. Now, have someone hold the animal by the feet, place on a gambrel, or hang from a horizontal branch by running rope through between the rear heel tendons and bones. Grasp the skin firmly and pull down a few inches on each leg at a time.

When you get to the tail, work your fingers around the top and pull the skin back on the tail a little. At this point you will need a special tool (“tail puller”) to remove the tailbone. If you do not remove the tailbone, it will start to rot, and the hair will “slip” or fall out in as little as a day. You can easily make one by drilling near one end several sizes of holes down the center of a thin, sturdy board. Split or saw the board in half. Wire the halves together on the far end just beyond the holes.

Open the tool and clamp down hard on exposed tailbone with whichever hole fits tightest. Hold the tool with one hand and pull the tailbone out with the other. The tailbone should pop right out with enough force. Make sure to split the tail down the underside with a very sharp knife all the way to the very tip. It helps to insert a rigid guide into the tail, such as a thin flat piece of wood so that the cut is straight. This is especially important for grey fox, which has a black stripe running down the tail. If you don’t cut straight, the stripe will become crooked.

Once the skin is off the legs, you can pull down with more force, and also work your fist between the skin and the back. When you reach the shoulders, hold a front leg with one hand, and with the other feel for the shoulder blade. Push the leg towards the other hand. When you see the shoulder muscle exposed, work your fingers all the way around the leg until you are all the way through. Now, bring both hands to the meat side. Hold the leg below the shoulder, and with the other pull the skin down the leg. If you are not going to save the claws, make a cut all the way around the inside of the skin near the ankle and pull off. Repeat for the other leg.

Now, the hard part begins. In many animals, the skin of the neck is thicker and more firmly attached to the underlying muscle. Pull the skin tight, then use a knife that is not too sharp to make quick, light cuts through the membranous white connective tissue (NOT the muscle or skin!). Repeat

many times until the skin has pulled to the base of the ear. Feel for the ear bases and cut through the cartilage close to the skull. Next, feel for the eye sockets. Pull the skin tight and cut close to the bone, leaving the intact eyelids on the skin. Feel for the gums. Towards the back of the jaw, pinch the skin, pull tight and slice through. Cut the gums away, working towards the nose. With small cuts, remove the skin from the chin, pulling the whole time. Pull the nose skin over the cartilage (use small cuts if needed). Near the tip of the nose, cut down all the way through the cartilage—the skin will come free.

Feet On

To leave claws and feet attached to skin, peel skin back to the ankles. With the skin held tight, make small cuts all the way around the ankle and repeat until you reach the long foot bones. When you reach the dewclaws, cut through the joint and continue downwards. This will take some time and patience. When the long foot bones are completely exposed, push a sturdy stick or nail between each one and pull down carefully towards the claws. When you reach the last bones to which the claws are attached, cut through the joints between these and the long bones with a pair of wire cutters. The process leaves the claws on the inside of the leg skin—you will turn them right-side out after tanning. Larger animals will require the fat to be cut or scraped from the insides of the pads so that they do not rot. If rot sets in, in addition to an awful smell, the claws and hair will fall off the skin.

Turning the Ears

If you intend to save the skin of the head for tanning, it will be necessary to "turn" the ears, or remove the cartilage, both so that the skin of the ears will dry quickly, and so that it can be softened during tanning. Make small cuts around the base of the ear until the cartilage is exposed. Work the skin on both sides to the edges with your fingers. Begin to pull the cartilage out with a pair of pliers while working a dull, thin, flat stick between the skin and cartilage towards the tip of the ear. Proceed very slowly and be patient. The skin of the inner ear is often paper thin and can tear easily.

Butchering

With the animal suspended by hind legs, hold a front leg near the shoulder and move it back and forth so that you can see where the muscle attaches the shoulder blade to the ribcage. Cut all the way around the shoulder, and the leg will come free.

Cut through the ankle tendons of the front feet and all the way around the joints. Bend the foot forward and twist. The ankle will pop out of socket, revealing the white ligaments that connect the bones. Cut through these and the foot is removed. Cut all the way around the head to the vertebra, and twist it a few times to remove. Feel for the top of the spine, and on either side cut down until you hit bone, then run the cut all the way to the pelvis. The sides of the vertebra are “L” shaped—feel for the lower leg of the “L” and cut sideways so that you connect with the first cut. Remove the backstrap.

Using a heavy knife or axe, chop through the sternum between the ribs. Chop again close to where they attach to the spine and remove. Chop through the spine near the pelvis. Release one ankle from the gambrel or rope. Feel for the inner edge of the pelvis and cut down towards the hip socket, moving the leg back and forth to pinpoint its location. Pull the hip out of joint and the leg is free. You are left with the pelvis attached to the other leg. Leaving the leg hanging, repeat the process to detach the pelvis.

Drying

Cut the meat from the bone into chunks about 4” square and an inch or two thick. These chunks can then be cut in big spirals with an extremely sharp knife to make long thin strips over 3 feet long that will dry quickly in the sun. Thicker areas can be further cut like a “Z” to thin them, exposing more surface area.

Provided that there is little fat on the meat, the strips can safely be dried and stored without the use of salt or smoke, although I still like to put a little salt and crushed red pepper on mine to add some flavor. Hang the long strip over fences, tight strings or branches, in full sun and preferably with a breeze. If the weather is not conducive to quick drying, the strips can be hung under a covered area well above a smoky fire. They may also be placed on oven racks. Set the temperature at about 150 F and leave door slightly ajar. Commercial dehydrators are also effective. If salt is not used, dry the meat until it snaps like crackers. If any moisture is left, bacteria and mold can grow on the meat.

After rinsing, the intestines can also be saved for sausage casings. Freeze or dry: tie off one end, inflate from the other using a straw or reed, tie off, and hang up to dry.

Grinding Meat & Making Sausage

The most useful gift I ever received was a hand-cranked meat grinder. Grinding allows you to turn even the toughest, most sinewy meat into tender hamburgers and sausage. A typical hand grinder consists of a body with a vertical funnel on one end, an auger to push the meat into the

blade, metal sieves with various sized holes, and a clamp to attach it to a table.

Cut the meat into small cubes about 1 inch square, drop into the funnel and grind away! If you put larger pieces in, the tendons and sinew have a tendency to wrap around the auger and blade and jam everything up. Make sure to put a plate or dish under the sieve to catch the meat.

Once the meat is ground, it can then be mixed with spices and fed back through the grinder to stuff sausage casings. To make sausage, attach the plastic tube beneath the ring that holds the blade and sieve in place. Turn the grinder until the meat almost comes out of the tube. Tie one end of the intestine or artificial casing closed, and feed all the way over the tube. It is important to make sure that no air bubbles are formed. Continue feeding in the meat and turning the crank. Tie off the intestine at intervals to create links.

100% natural sausage—deer intestine casings.

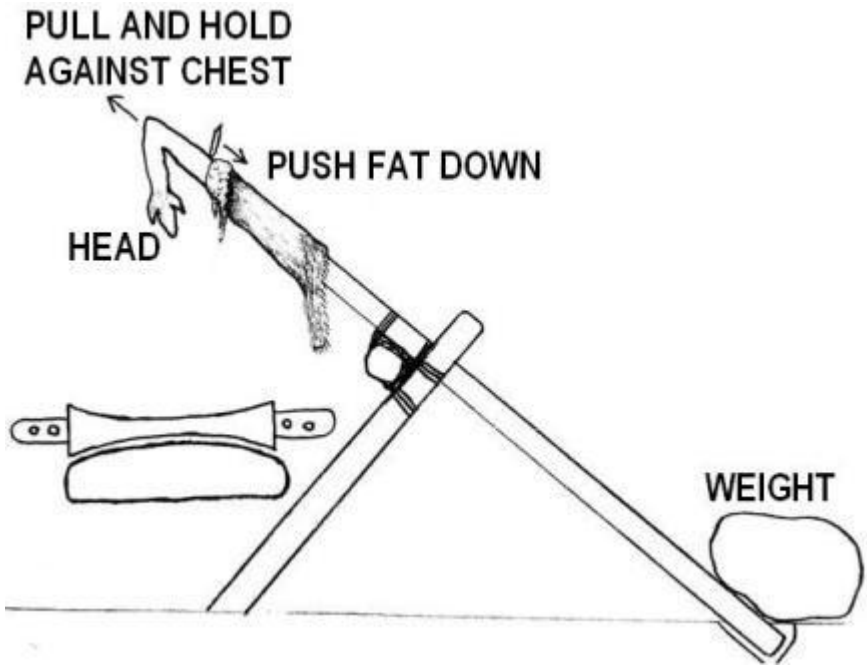
During smoking, if no nitrite preservatives are used, it is important to actually cook the sausage and remove every bit of moisture if you do not intend to eat immediately, as deadly bacteria can form in sausages if not prepared properly. Some people like to add fat or fatty cuts of meat to lean deer meat, but I've made sausage with deer meat alone and it still tastes pretty good!

Smoked until dry for long-term storage

Fleshing

Fleshing is the processes by which all fat and muscle are removed from the skin. A smooth, pointed beam with a curved upper side is set in the ground at about a 45 degree angle. The skin is pulled over the beam so that the nose of the animal is upwards. Hold the skin firmly in place with your chest (an apron helps). Hold the knife with the blade perpendicular to the beam and push down and forwards.

My home-made double-sided fleshing knife. The blade edges are curved to match the board curvature. One side is kept razor sharp. The dull, unsharpened side is used the most.



Rotate the skin, and repeat. Once you have a line going all the way around, pull the skin up the beam a few inches and repeat. If the weather is warm, it helps to have a little sawdust on hand to soak up any grease that drips down the beam and onto the fur.

Stretching and Drying

For large game, tack, stake, or nail skins flat with the fur side down. Tack as close to the edge as possible without tearing the hide. Start with the legs, but don't make it drum-tight. It is kind of like putting on lugnuts. You

tack one side, then the side opposite it so that the skin is stretched uniformly in all directions. There is no need to salt the skin if all fat has been removed. Depending on the weather, the hide will be thoroughly dry and ready for storage or tanning in one to three days. Make sure to protect it from rain, humidity, dew, etc. which will slow the process. If the day is very humid, a fan will help. Do not leave the hide in direct sun or use a powerful heat lamp, as the hide will dry unevenly and warp, making the tanning process more difficult.

For all game that has been case-skinned, stretching boards or wires will be required. Boards are long, thin with one end tapered. The fur market has published dimensions for boards, and even though I don't sell to the market, I have found these templates to be very useful. I have one size board for possums, striped and hog-nosed skunks, one for squirrels, rabbits, spotted skunks, and ringtails and I combine the two for grey fox. I use commercial wire stretchers for coyote and raccoon.

Pull the skin down over the stretcher with the fur side in. Pull the rear feet down and tack towards middle of board, or place on spikes on wire stretchers. Tack the chin tight or cut off. Pull tail down and tack, cover

with a screen, or tie strings around the board and tail to hold open. Cut away the loose skin between the hind legs where the genitals or pouch in the possum is found. Fur markets call this the “inspection” window, as it allows prospective buyers to see the quality of the fur. However, they often recommend cutting away much of the lower belly skin and forelegs as well, which is not necessary if you will not be selling to the market.

It is VERY important to insert a “belly board”, or thin stick that has been smoothed on all sides, up under the belly side all the way to the mouth. The skin will dry drum tight, and without this, would be impossible to remove from the stretching board without cutting. Wire stretchers do not require this, as they can be compressed and the furs will slip easily from them. If the weather is warm, hang the furs upside-down so that melting grease will drip towards the nose away from the fur.

To dry a skin with the fur side OUT (which is the usual course of action for fox and bobcat) place on stretcher with fur side DOWN and allow to dry until the skin has the feel of leather, but is still cool to the touch and flexible. Remove skin, reach into, grasp nose, and slowly pull right side out, using the other hand to roll from the outside. Return to the stretcher and allow to finish drying. If a skin has become too dry prior to turning, it may be rehydrated by wrapping with a wet towel and allowing it to sit for an hour or so.

Tanning

Tanning is the process by which a stiff skin is transformed into a luxuriant, soft, pliable fur. Once the skin has dried, buff the skin side with rough sandpaper or a flat rock to remove the smooth reddish film and open up the surface so the tanning solution will penetrate quicker. If the skin is very thick, thinning will also help. I have found wood graters to be very effective for sheep and pigskin, but it is best done while the skin is still staked out flat. Be very careful around the belly area, which is very thin. For all other skins, just use sandpaper for thinning.

Next, prepare a tanning solution. A good mixture will contain an acid to break apart the “hide glue” and an oil to lubricate the interlocked fibers

so that they pull apart during the breaking process. I tanned my first hide with acorns, others with brains, mixtures of dish soap and lard, eggs, eggs and shampoo, and by chewing (saliva contains enzymes that break down protein, and the chewing breaks the hide at the same time) Rub the tanning solution all over the skin side. If conditions are hot and dry, place a dampened towel over the skin and check from time to time. Once the skin has returned to a pliable condition, it is ready for braking. Usually, allowing the solution to soak in overnight is plenty of time.

The next day, check to make sure the hide is stretchy. If so, place back on the stretcher if cased, or stake out flat, and allow it to dry just a little. Now the hard work begins. The hide must be continuously pulled back and forth in all directions until it is completely dry, which can take all day depending on the weather. If you stop before this, it will become stiff again. If it gets too tiring, just toss it in the freezer while you take a break. You will notice areas of the hide turn white as you pull it. In these spots, the fibers have pulled apart and the spaces between them have filled with air. To get a quick idea of what breaking actually involves, take a piece of writing paper and crumple it into a ball. Roll it between your palms. Unfold and repeat until the paper is soft and flexible. If you look closely, you can see how the fibers have begun to pull apart.

There are a number of ways to **break** a hide. The simplest is to get some folks to help you. Have your teammates grasp the hide by the edges. First two people facing each other pull in opposite directions, then the next two, and so on. After a round, move your hands a few inches down the edge of the hide and repeat. You can also plant a vertical wooden stake into the ground (use a thick, rooted sapling to save time) sharpen the tip so that it has the shape of an axe head, or actually bolt a dull axe head to the stake (which works much better than wood). Grasp the hide with both hands and vigorously pull up and down over the edge, working all surfaces. You can use the back of a chair the same way for thinner hides. You can also pull and twist the hide over a very tight metal cable, or lace the whole thing flat in a large frame and press a hand-held paddle-shaped

stake into and across the hide. When the whole hide has turned white and is no longer cool to the touch, you can proceed to the next step.

Breaking a hide that has completely dried *IS* possible, but it will only become flexible like the piece of paper and not develop the stretchy “loft” that comes with pulling a hide that is still damp and elastic.

Smoking forces tar-like compounds into the air spaces between the fibers of the skin. Without this step, if the hide were to get wet, it would soak up water like a sponge, and when it dried, would revert to being stiff like it was before breaking! Smoking also penetrates the hide with nasty compounds that repel insects and bacteria that would otherwise love to munch away on a beautiful fur years down the road. It also helps to lubricate the fibers (like the oil) and changes the color of the hide from white to yellow/brown or other colors depending on what kind of materials are burned and for how long. Tie a case-skinned animal with fur side OUT onto a long pipe or sew onto cloth sleeve and completely smother the fire so its all smoke and no heat. If you sew up/staple/tape the eyelids and lips shut the smoke will penetrate faster. For hides like deer, fold over and sew into a tube with fur side OUT.

Skull Cleaning

Selling well-cleaned skulls can be a great additional income. They can be sold to schools for biology study aids, to museums, artists, individual collectors, and those looking for novelty items.

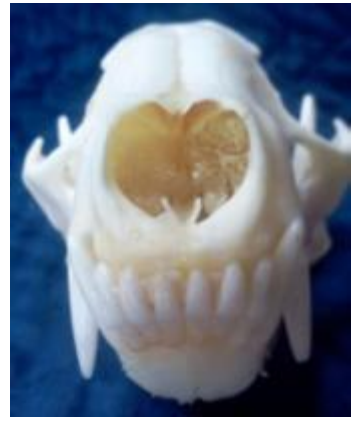
Place the skinned head in slow cooker and cover with water. Set on 350 F. Check periodically. If the water begins to boil, turn the temperature down so that it just simmers, like making a pot roast. Remove the head when the muscle peels back from the top of the skull and the meat is tender to the touch (which can take several hours or all night). The meat should fall easily from the bone. Carefully pick off all meat, remove eyeballs, nerves, veins, gums between teeth, cartilage around nose and ears. The teeth will have loosened and may fall out, so take care to save them and glue back in once everything has dried. Insert a thin stick, wire or probe into the brain cavity through the spinal hole, run water into the opening and use a scrambling motion to break up the brain and mix it with water. Turn the skull nose up and shake the brain out of the spinal opening. Repeat until you are certain all brain has been removed. Use forceps to remove any membrane that may not have come loose.

Left: *opossum,* ***right:*** *coyote*

To whiten the skull and further break down small pieces of flesh, immerse it completely in hydrogen peroxide—the stronger the better. Peroxide gel

(used to bleach hair) can also be painted on the surface of larger skulls. DO NOT use bleach as it will dissolve the bone! The skulls may be left in the peroxide for weeks with no ill effects, but they are usually plenty white enough in one or two days. Rinse the skulls with water and pick off any remaining bits of meat (which will also have turned white by now). Give them a dip in the peroxide again, remove and allow to dry. Placing them under a lamp will help speed the process, but too much direct heat can cause the bone to crack.

Nasal bones are extremely fragile and filled with membranes, nerves and blood vessels. Simmering often does not remove all of this material. Prior to simmering, it can help to allow the head to rot for a day or two in warm weather in a plastic bag with holes poked in it. Maggots and bacteria will quickly enter the nasal cavity. Too long with the maggots though, and the skull may be stained yellow, which is very hard to remove even with peroxide.



I know a few people who use tanks of dermestid beetles to clean skulls—beetles do a much more thorough job than simmering, but have several drawbacks. It takes a large colony from a day to a few weeks to clean a skull, the smell can be nauseating to some, and you have to be prepared to constantly maintain your colony at all times. Some folks also place skulls on ant piles, but I wouldn't recommend it because ants can start chewing into the bone itself. Cold water mastication (allowing skulls to rot for weeks or months in water) is another very smelly (but effective) method.

Fishing

Species

Unless otherwise noted, the following species have no daily bag limit or minimum length requirement

Redhorse Suckers *Moxostoma* spp., 1-2 lbs, **850 kcal**

Suckers are the primary freshwater target of my cast net. I have a lot of success catching them in deep, shaded, slow-moving sections of the Guadalupe River, particularly in the early morning and late evening.

Suckers rank as the tastiest frewshwater fish in my opinion as they have a high fat content, giving the meat a creamy texture. Most people consider them to be “trash” fish because they are bottom feeders and have numerous thin “y” shaped bones along their spine. After cooking, just take care to watch out for and remove these bones prior to eating.

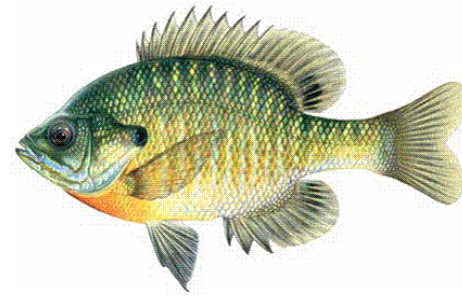
Sucker, bluegill, and shiners split and dried.

Shiners & Shad *Lythrurus*, *Cyprinella*, *Dorosoma* spp., 4-10 grams, **7 kcal**.

Commonly referred to as "minnows", most of these small fish prefer similar habitats—shallow, fast—flowing streams with gravel bottoms. It is possible to catch dozens with a single cast. They are superb live bait—bass and gar LOVE them! Just make sure that your bait bucket stays cool and has plenty of water flowing through it or else they won't stay alive for very long!

They can be eaten after cooking, or dried like the small fish that are caught with butterfly nets and considered a delicacy in Lake Patzcuaro, Mexico, where they are fried, covered with chili powder and lime, and eaten whole by the cupful. I typically don't gut the smaller ones—the guts have a strange bitter-sweet flavor, but it's not too bad!

Bluegills *Lepomis* spp., 0.2-4 lbs, **220 kcal**



Also called sunfish and perch, these fish abound in Texas freshwater and are also known as panfish for their ability to provide food for the pan! They prefer slow-moving sections of rivers, ponds, and like to stay near shaded banks, sunken logs and weeds. While they sometimes end up in my cast net, most of the places they prefer contain a lot of things it could get tangled in.

I prefer to catch them with a simple stick and line, with #6 or #7 barbed Eagle Claw hooks, and no sinker. They go after all kinds of bait—worms, grasshoppers, bits of bread, but they REALLY love small freshwater

mussels, which can usually be found buried in the mud or gravel along the banks of the streams they live in. They can also be caught using simple fish traps.

Rio Grande Cichlid, *Cichlasoma* spp., 0.2-1.5 lbs, **220 kcal**

These abundant tilapia-like fish are found in habitats much like that of the bluegill and caught with similar techniques.

Gar, **Spotted**: *Lepisosteus oculatus* 1-8 pounds, **Alligator**: *Atractosteus spatula,* up to 300 lbs **1,700-170,000** kcal

Commonly seen feeding in schools on the surface of slow-moving rivers in the late afternoon and evenings. I've caught spotted gar with cast nets, trotlines, and with a rod and reel. As soon as I feel a tug on the line, I let a bunch out and let them run with it. They spin around like little alligators and get the string caught up in their hundreds of needle-like teeth. They can also be easily taken by bow fishing, and could probably be speared with a heavy-duty leister (a 3-pronged spear with barbs or serrated edges).

Alligator gar are much less commonly seen, and given their enormous size, are best taken with harpoons and fishing bows, although some fisherman catch them with nylon rope that has been unraveled (which catches on their teeth).

Considered a trash fish, many gar taken by bow fisherman are discarded. They are however DELICIOUS and not filled with small choking bones as many imagine! I gut them, then bake whole. The heavy armor will peel away easily when done, revealing steaming white meat with the consistency of halibut.

Bag limits: Alligator gar: 1, no min. length. No bag limit for spotted gar

Catfish, up to 100 lbs**, 800-50,000 kcal**

These omnivorous bottom feeders can grow to huge sizes and are the primary quarry of the trotliner. They will take live or dead bait, the smellier the better! I prefer to use bait that can be strongly secured to the hooks, like whole small fish and shrimp. They spend their days hiding in deep water, under large rocks, and in holes in muddy river banks. They are a real pain if you accidently catch one in a cast net, as they have sharp spines lined with equally sharp barbs that can become hopelessly tangled in the net. In 2011, Texas finally legalized noodling for catfish, which can be a very effective way for courageous folks to get some real monsters!

Bag limit: Channel AND Blue: 25/day, min. length 12 inches Flathead: 5/day, min. length 18 in.

Armored Catfish *Hypostomus plecostomus*

These are invasives from South America. Their ancestors were small aquarium fish that grew too large and were released by their owners into local rivers. They are covered in hard plating like gar, and have long barbless spines. They are very common in parts of the San Antonio and Comal rivers. Look underwater for muddy banks that are riddled with softball-sized holes, and you've hit the jackpot! If you've got the courage, you can stick your arm down these holes and pull the fish out. Unlike traditional catfish noodling, I grab these by the head or tail rather than let them latch on to a hand (their mouths are really too small for that).

They have surprisingly little meat for such a large body—two thick strip on either side of the spine. I gut them and cook whole, or cut through the armor from the dorsal fin with tin snips, remove the meat and fry.

Turtles 5-20 lbs **>1,400 kcal**

Red-eared slider turtles (*Trachemys scripta elegans*) are extremely common in the Guadalupe and San Antonio Rivers and can often be seen sunning in large numbers on protruding logs and boulders. I have caught them by hand, with line and hook (let them swallow it) and dip nets.

To kill, pull out head and chop off. It is necessary to chop or saw open the shell on the side to remove guts, which often contain delicious yellow turtle eggs.

Common (though NOT alligator) snapping turtles may also be taken.

A hunting license is required to take non-protected turtles and frogs.

Crayfish 30 kcal

While often not as abundant or as large as they are in some areas, crayfish, or "crawdads" can be easily found in muddy ditches, ponds, lakes and rivers. In Canada I dove for them in lakes, finding larger ones deeper down, and in Montana collected them by lifting large rocks and slowly reaching for them. They can be collected in greater numbers and with less work with simple traps.

After removing the digestive system (stomach and "vein" running under the tail) I eat them whole, shell and all. Small crayfish make superb bait for catfish trotlines and for bass.

Crabs 1-2 lbs. **>100 kcal**

Crabs are very common in the Laguna Madre and can be easily caught with simple crab traps, which usually consist of baited wire baskets or boxes ("pots") which are pulled up after a while. Crab traps come in dozens of different variations—see TPWD handbook for regulations. I also catch crabs with spears and my bare hands (though care must be taken with larger crabs). Lift ocean debris and you are likely to find a crab.

They can move fast, but tend to hide in seaweed or sink down into the sand in murky water.

Crab meat is extremely sweet and tasty—it is found not only in the claws, but also the legs and inside the main shell. I usually just cook them whole on hot coals until they turn red.

I eat hermit crabs too, which attach themselves within abandoned whelk shells. However, they are very low in calories and not particularly tasty, so they are more of a survival food that can be easily gathered if needed.

Blue Crab min. length 5 in. across widest part of body from spine to spine

Oyster *Crassostrea virginica***, 10 kcal**

I LOVE shellfish! They are delicious, are very easy to gather and were one of the Karankawa staples. One of my favorite spots is the Laguna Madre side near the bridge between Mustang and Padre Islands. They are cemented together in clumps half-buried in the mud. They are RAZOR sharp and face upward—I've had some really nasty wounds from them—so make sure to wear water shoes or walk with a slow, shuffling motion. Carry a hammer or similar tool so that you can knock loose the larger ones to keep. At first, you may have a difficult time telling which shells contain oysters and which are filled with mud! Living oyster shells are subtly different in color, tightly shut, and will sometimes squirt out small amounts of water/bubbles when removed. They can be eaten raw, but I prefer to toss them in a big pit filled with hot coals for a few minutes until the shells begin to open. Keep an eye out for pearls!

Make sure to check for TPWD closures due to spills, and avoid gathering during red tide.

Season: *November 1 through April 30, sunrise to sunset, coastwide.*

- *Oysters must be 3 inches or larger as measured by the greatest length of the shell.*

- *Oysters under 3 inches must be returned to the reef from which taken.*
- *Oysters 3/4 inch to 3 inches may not make up more than 15% by number of oysters in possession.*
- *No more than 2 sacks of legal oysters may be possessed per person. A sack is defined as 110 pounds of oysters including the sack.*
- ***Consumption of Clams and Mussels** taken from public **fresh waters** is prohibited by the TDSHS.*

Lightning Whelk, *Busycon perversum* **40 kcal**

These giant predatory snails can be found in the same locations as oysters, and were also heavily utilized by the Karankawa. You often find their trails etched into submerged mudflats, and can follow them to an easy snack! Toss the shell into the coals with the opening facing upwards so that the meat boils in the shell. When done, the body will easily pull free from the shell.

Striped Mullet *Mugil cephalus***,** 0.5-8 lbs**, 950 kcal**

When I tell people that I eat mullet, I often get some weird looks! Today finger-sized mullet are used for baitfish, but Karankawa livelihood depended on following schools of large mullet in the Laguna Madre, which they speared, caught with nets and trapped in weirs.

Mullet can be caught on both sides of the island, but it can be difficult to throw a large net in pounding six-foot waves! During the day, they prefer deeper, cooler waters, such as boat channels and troughs between sandbars. In the early morning and evening, I often catch them closer to shore. It is especially easy to locate large schools in the Laguna Madre as they nearly beach themselves feeding in water a few inches deep—the otherwise smooth water ripples and shimmers!

Mullet are delicious—I like to cover them in lemon pepper and bake them slowly in a grill over some coals. The white creamy meat falls easily off the bone when done. They can also be filleted and fried, or split and dried for later use.

May not take from public waters, or possess on board a boat, mullet over 12 inches during October, November, December, and January. No limits apply during other months.

Flounder, *Paralichthys lethostigma***,** 1-14 lbs, **2,240 kcal**

These bizarre smaller relatives of halibut swim on their sides, looking like rays, and during their development, both eyes end up on what becomes the UP side of the fish. They lie flat on the mud of the Laguna Madre and venture into the shallows at night to feed. They are easily speared with the aid of a spotlight or torch.

Daily bag is 5 fish and may be taken by gig, except for the period Nov. 1-30 when the daily bag is 2 fish and flounder may be taken only by pole and line. Minimum length 14 in.

Commercial Fishing

A moratorium on the sale of licenses or a license management program (limited entry) has been in effect for the Texas ***bay and bait shrimp*** *fishery since 1996, the* ***crab*** *fishery since 1998, the* ***saltwater finfish*** *fishery since 2000 and both the* ***gulf shrimp and oyster*** *fisheries since 2005. To retain eligibility in each of these fisheries, purchase of the previous year's license is required. A license buyback provision is in place for bay and bait shrimp boat, crab and finfish commercial licenses, but not for gulf shrimp boat or oyster boat licenses.*

A ***General Commercial Fisherman's License*** *is required for any person who: catches aquatic products from the waters of this state for pay or for the purpose of sale, barter or exchange or any other commercial purpose.*

A person who holds a ***bait dealer's license*** *and catching bait only is NOT required to possess a General Commercial Fisherman's License*

A person who is licensed as a bait dealer and who takes finfish for bait only is not required to obtain a commercial finfish fisherman's license.

A Bait Dealer's License is required for any person who catches, transports or sells his own catch of minnows, fish or other aquatic products (except shrimp) for bait. note: In addition to this license, a permit to sell non-game fish taken from public fresh water is required. The fee for this license is $60 and can be obtained by calling (512) 389-8037.

It is unlawful to sell any fish taken from the public fresh water of Texas except for the following: (1) channel and blue catfish over 14 inches in length taken from designated counties, and (2)) ***A PERMIT TO SELL NON-GAME FISH*** *is required to sell alligator gar, shortnose gar, spotted gar, longnose gar, bowfin, gizzard shad, threadfin shad, common carp, goldfish, grass carp, bighead carp, bigmouth buffalo, black buffalo, smallmouth buffalo, river carpsucker, black bullhead, yellow bullhead, freshwater drum (gaspergou), Mozambique tilapia, blue tilapia, redbelly tilapia, Rio Grande perch, silversides, mullet, shiners, minnows and hybrids of these species taken from the public fresh waters of this state.*

Techniques

Cast Nets

A cast net is an ingenious invention—by far the most efficient way to fish besides using gillnets (illegal) or massive seines. The net is circular, with mesh openings that must be smaller than as designated by TPWD. Dozens of weights (lead, steel, or ceramic) are attached around the circumference about a foot apart. A number of lines are attached to the edge and run along the underside through several rings and spacers at the top, all connecting to the mainline. These lines cause the base of the net to contract and envelop around the fish when the mainline is pulled in.

The two primary net materials are braided nylon and monofilament. Nylon nets open and become flatter quicker, and also entangle the fish better. However, they also tend to easily snag and tear on submerged rocks and branches, so I prefer the stronger mono nets for rivers, lakes and ponds. I use the largest legal size nylon net (14 ft. dia) for the ocean, and an 8 ft mono net elsewhere.

Everyone develops their own technique for throwing, and different methods are often used for various sizes.

First, I make sure to secure the mainline to my left hand (I'm right handed). You don't want to throw your net out and forget to hold on! Then, I coil up the line and hold it with my left hand. Again, with the left hand I grasp the top of the net near the ring and shake it up and down a few times to make sure nothing is tangled.

Then, if it's the large net, I grasp it by the middle with my RIGHT hand, bring it up and hand it over to the LEFT one. (The left hand is now holding the coiled line and the net in 2 to three spots). I then grab the base of the net that is closest to my body, pull it up and grasp it between my teeth. I hold my left hand out, reach down and grasp the net by the base with my right hand.

Facing OPPOSITE my target, I spin around clockwise, throw the net with my left hand, releasing the net and mainline from my hand, then opening my mouth and right hand a split second later.

If you've done everything correctly, the net should spin open so that it is flat like a pancake and travel 5 to 20 feet away from you.

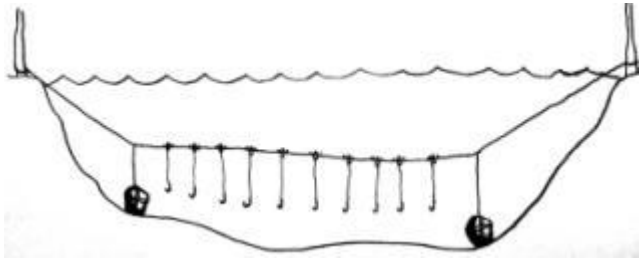
It can take a lot of practice to get it right, especially for the large nets, but once you've got it down, you'll almost never go hungry if you're near water! Allow the net to sink to the bottom (you can feel the tension on the mainline go slack) then pull in, coiling in your left hand. If you got a big catch, you should be able to tell right away! Bring the net onto the dock, boat or shore, and open by raising the plastic spacer. Very small fish may be caught by their gills and you will have to remove them one at a time. If you have a stick tangled in the line, just be patient and work it out. When you are finished, spread the net out, remove debris, check for tears, and allow to dry.

- *May be used to take **NONGAME** fish and shrimp only*
- *May not be greater than 14 feet in diameter.*
- *In **SALT WATER**, nongame fish may be taken for bait purposes only*

Trotlines

- ***Tag Requirements:** Must be used with a valid **GEAR TAG**. Properly marked buoys or floats qualify as valid gear tags. Gear tags must be attached within 3 feet of the first hook at each end of the trotline and are valid for 30 days after the date set out.*
- ***Construction and Design Restrictions:** May not have more than 50 hooks on any one trotline.*

- *Nongame fish, channel catfish, blue catfish, and flathead catfish may be taken by trotline.*
- *Red drum, spotted seatrout, and sharks caught on a trotline may **not** be retained or possessed.*



Ready-made trotlines can be purchased very cheaply. To set and check a trotline, you may want to use a small boat (preferably NOT an inflatable raft—small flat bottom boats are perfect). To keep hooks and leaders from getting tangled, place them in a foam noodle. Tie one end of the trotline to a branch or stake on or near the shore, and tie the other end on the shore opposite. Make sure to leave enough slack so that the trotline will reach the desired depth (deeper the better—also helps prevent entanglement in passing propellers!). Tie weights (rocks, concrete or sand-filled jugs) a few yards from each end with leaders several feet long. Alternatively, you can place one weight on the center of the line and floats on the ends. Pull the boat along the line, and attach the baited hooks to the line. I prefer to use shrimp or baitfish because they can be better secured to the hook than stinkbait or baitballs, which are often quickly eaten by smaller fish or crafty catfish.

If you don't have a boat, you can use a smaller throwline anchored to a weight, a sail-line, which uses the prevailing wind to pull the line away from the shore using a small tarp-covered framework, or a floating jugline.

Noodling

Noodling is the art of catching fish, predominantly catfish, with your bare hands. It is probably the oldest and simplest fishing technique in the

world, effective, but potentially very risky. Search in dark muddy waters with your hands and feet for holes in the mud, under banks or spaces under rocks. If you are in deep water where you are going to have to put your head under, it's a good idea to call over your partner at this point just in case you get caught! Reach into the hole. A large catfish will bite down on your hand, at which point you hold onto his jaw or gills and either pull him out or run a stringer through his gills.

Its also possible to catch other fish by hand (I've caught bluegills) but this is more often referred to as "tickling" as you move your hand VERY slowly around the body of the fish, making him feel comfortable and then grab him!

Dangers include getting spined by the catfish, having a monster catfish latch on, and being bitten by snapping turtles, water moccasins and even beavers!

May be used to take nongame fish, channel, blue and flathead catfish in fresh water only.

Traps

- *May be used to take **NONGAME** fish only.*
- *Trap may not exceed 24 inches in length. The throat may not exceed 1 inch by 3 inches.*
- *In **SALT WATER**: **GEAR TAG** valid for only 30 days must be visibly attached.*
- ***Gear Tag:** A tag constructed of material as durable as the device to which it is attached. The gear tag must be legible, contain the name and address of the person using the device and the date the device was set out. Date is not required for saltwater trotlines or crab traps.*

Spears

These are effective mostly in shallow water, when fish are spawning, or when they are feeding close to the surface. They are often jabbed into the fish rather than thrown. It's a good idea to have one or more barbs and prongs on the business end so that you do not have to have an incredibly accurate thrust and also so that the fish will not slip off. Special gigs are sold for frogs that have spring-powered barbed jaws that snap shut when a frog makes contact with the simple trigger between them.

*May have single or multiple points, be barbed or barbless, and may be used to take **NONGAME** fish only.*

***Left:** Spring-powered frog gig. When the comb-shaped trigger in the center hits the frog, the jaws snap shut.*

***Right:** Trident useful for large fish—carp, suckers, catfish and small gar.*

Inuit-style leister typically used to take fish when spawning in shallow water. The barbs are mounted on flexible arms which open when pushed onto a fish.

Gathering

Species

Sotol, *Dasylirion* spp. **40 kcal/oz**

Edible part/s: Inner heart

Season: Year round, sweetest in late winter and early spring when mature and just before flower stalk growth

Habitat: New Mexico east to San Antonio. Dry arroyos, rocky south-facing slopes and uplands, roadsides.

Harvesting: Use a machete, long knife or saw to remove the long leaves close to base, revealing the inner heart. Dig around the base, and lever the heart out of the ground with a long sturdy pole using a rock or log as a fulcrum. The roots may need to be cut with an axe.

Preparation: Cut the remaining leaves off and remove the dead, dry leaf bases. Bake for 3 days. Cooking is finished when the color of the deep inner heart changes from white to deep golden/brown-orange. Fold and chew the leaf bases and spit out fibers. The base of the inner heart is similar to mashed sweet potato and may be eaten whole or pressed into cakes and dried. Cooked heart can also be pressed like sugar cane to extract sweet juice, which can be drunk fresh, boiled into syrup or fermented to make pulque-type beer or a tequila-like liquor.

Note: Raw plant contains toxic saponins which cause severe irritation of the mouth and digestive system. Leaves may be used for weaving and lashing, flower stalks for frameworks and fire kits.

Agave/Mageuy *Agave* spp.

Edible parts: Baked heart and leaf bases, steamed flower stalk, sap

Habitat: Chihuahuan Desert, Chisos, Guadalupe & Carmen mts, common cultivar.

Preparation: Just before sending up the flower stalk, the central bud can be chopped out and a bowl shape cavity excavated at the base. Sweet sap (aguamiel: honey water) that would have provided energy to the rapidly growing stalk pools in the cavity and can be siphoned off each day and drunk raw or fermented into the alcoholic beverage pulque.

The hearts of mature plants can be baked along with the leaves, as with sotol. A specialized tool called a quebrantador is traditionally used for the task of removing leaves and heart, and consists of a long sturdy pole with an axe-like blade on the business end.

Note: While west Texas does contain several small species of native agaves (primarily lechuguilla) the large agaves seen throughout Texas are cultivated species indigenous to Mexico.

Wild Onion *Allium* spp. **20 kcal/oz** caramelized

Edible Parts: Bulbs and shoots

Habitat: Meadows, riverbanks, fields.

Note: Wild onions were gathered in large quantities by prehistoric Texans and cooked in mass in earth ovens in regions where sotol and other such foods were not available. Onions, like agaves and sotol, contain high numbers of complex polysaccharides like inulin that are difficult or

impossible to digest when raw. Caramelization breaks these down into simpler sugars, resulting in a dramatic increase in sweetness and increased caloric availability.

Spanish Dagger *Yucca treculeana*

Edible Parts: Flowers, fruits

Habitat: South Texas Plains, Chihuahuan Desert, dry scrubland, canyon rims.

Season: Flowers: Late winter, spring. Fruit: Late spring-summer.

Preparation: This yucca produces large seed-filled fruit. Fruits are best picked when mottled whitish/green-brown and roasted or cooked in an earth oven or on hot coals. They taste somewhat like a cross between potato, plantain and date. The bitter seeds can be removed and pods dried for later use after cooking

Agarita *Berberis trifoliolata*, **14 kcal/oz**

Edible part/s: Berries

Season: Late spring, early summer

Habitat: Open woodland, dry brushy areas

Harvesting: Berries are ripe when deep red and fall easily from stem. Place basket or sheet beneath bush and beat with a stick. Berries may be separated from twigs and other debris either by shaking basket in a panning motion or by rolling them down an inclined board covered with felt-like material.

Preparation: Berries may be eaten raw or mashed and squeezed through a cheesecloth or loose basketry and drunk as a delicious beverage or simmered down into a naturally gelling jam, no pectin needed!

Note: Sweetness is highly variable depending on growing conditions. Other plant parts contain the toxin berberine, which causes the yellow coloration of the inner stems and is used as a dye and for medicinal purposes.

Wild Grains, 105 kcal/oz

Season: Spring to fall

Harvesting: You are really looking for grains that will separate easily from the "chaff," a hard, indigestible, lightweight shell surrounding the seed. Some grains are firmly attached to the stems, so pull or cut off the whole inflorescence. Others are loose and can be removed by running a hand down the stem. Some seeds can actually be shaken off into a bag.

Preparation: Loosen the chaff from the seeds by rolling them by hand on a hard rough surface, or beat with sticks, etc. I've even used a food processor to crack some of the tougher ones! You can separate the chaff from the seed by winnowing or panning. To winnow, toss the material into the air or drop onto a sheet. A light breeze will carry away the lighter chaff, but the heavier seeds will fall almost straight down. To pan, rapidly rock the material back and forth in a large tray. The chaff will move

upwards and can then be picked out by hand. Some seeds are so much smaller than their chaff that they can actually be sifted through screens.

Note: A number of wild and introduced grains thrive along thousands of miles of Texas roadside. While often viewed solely as a part of an agricultural diet, wild grains have in fact been utilized by foragers around the world, from Paleolithic Europeans to Aboriginal Australians in the Western Desert. During much of the year grains were by far the most substantial and reliable source of calories, perhaps the only edible plant food available.

Honey Mesquite *Prosopis glandulosa*, pods: **42** kcal/oz, flour: **106** kcal/oz

Edible part/s: Pods, seeds, flowers

Season: Summer to fall.

Habitat: Dry open fields, scrubland

Harvesting: Pods are ripe when light yellow, and best for making flour after they have fallen from tree and dried in the sun. They may also be picked and chewed raw.

Preparation: Ensure that pods are thoroughly dry and snap easily (place in sun or oven on low heat). Use hammer mill or large steep-walled mortar to pound pods until a course flower mixed with seeds and hulls is produced. Seeds are not easily crushed without machinery and are often discarded. Sift to remove seeds and hulls, or shake with rapid panning motion. Return flour to mill or mortar and grind/pound again. Use finer grade sift and return rough particles to mill until desired consistency is obtained. May be cooked like oatmeal, fried, added to grain flour for pankcakes, bread, and cookies.

Note: Pods are often infested with weevils, which do not affect edibility, but may reduce nutritional value. Larva may be killed by freezing or microwaving. Wood is extremely hard and makes excellent firewood.

Often viewed as a weed, mesquite was one of the most important foods for native peoples from Baja California to South Texas.

The pulp is rich in carbohydrates and naturally sweet with a low glycemic index. The extremely hard, small seeds were often discarded during

processing, but nevertheless are packed with protein. They can be crushed with hammer mills or boiled for hours until they become soft.

Prickly Pear *Opuntia* spp. Pads: **5 kcal/oz** fruit: **11 kcal/oz**

Edible part/s: Flowers, fruits, young pads, fruit, seeds

Season: Nopalitos: Spring, Fruits: Summer to fall

Habitat: Dry open fields and uplands, rocky south-facing slopes

Harvesting: Young pads are very thin and flexible and are easily identified by having small green cones in place of the longer spines of mature pads. Use gloves to pick. Fruits are ripe when deep purple and give a little when squeezed.

Preparation: Remove small spines from young pads by scraping with knife and rinsing in water or brushing with a handful of fibers. May be eaten raw, boiled, steamed or pickled. Rub spines off fruits with handful of fibers or singe for a few seconds over a flame. Cut in half or peel and eat raw. May also be squeezed and strained for juice, boiled into jam or sun dried (cut in half, remove seeds and place in sunny, windy area). Flowers may be eaten raw or cooked like cabbage.

Note: This plant was of huge importance to the peoples of South Texas and Mexico—so important that the Mexica (Aztecs) named their capital for it: *Tenochtitlan* (Place of Prickly Pear). While relatively low in Calories, its fruits can be gathered in huge quantities and are packed with vitamins. In vast arid stretches, it was often the sole source of liquid for miles around.

Texas Persimmon *Diospyros texana*, **36 kcal/oz**

Edible part/s: Fruits

Season: Summer to fall

Habitat: Woodlands, shrubby limestone hillsides

Left: *Ripe.* ***Right:*** *<u>almost</u> ripe!*

Harvesting: Fruits are ripe when deep black, no longer firm, and remove easily from stem when lightly pulled. To gather in quantity, place sheet under tree and shake!

Preparation: Fruits may be eaten fresh—just spit out the seeds! They can also be mashed, dried, or strained to remove seeds and skins and simmered into a thick pudding, jam or filling for empanadas. May be added to flour to make sweat bread and cookies.

Note: Trees are either male or female, so not all will have fruit. Fruits may also be used as a dye, and the wood is extremely hard and good for tool handles.

Acorn *Quercus spp.* **108 kcal/oz** (shelled)

Edible part/s: Nuts

Season: Fall to winter

Harvesting: Nuts are ripe when dark brown and fall from tree. Rake up! The first nuts to fall are often still green and infested with beetle larva. However, they may still be utilized although they are harder to shell and leach.

Preparation: Allow nuts to dry in the sun or in a slightly open oven on low heat so that the shell hardens and meat begins to separate from it. Nuts may be cracked one at a time, or roughly crushed shell and all, then separated from the shells by using a panning motion in swirling water (nut meat sinks faster). Pound the nutmeat into coarse flour or small chunks. Boil nuts and pour off dark liquid. Repeat as many times as needed until the water color turns from milky to clear and nuts change color from yellow/white to dark brown and no longer have a bitter taste. Leaching can also be accomplished by placing the flour in a basket in a stream for a few days, in a coffee maker, or burying whole for several weeks/months in swampy ground.

Note: Raw nuts and other plant parts contain varying levels of tannins (useful for tanning and dying) and most species cannot not be eaten without leaching.

Hackberry *Celtis* spp. >**97 kcal/oz**

Edible part/s: Drupe (seed and surrounding fruit)

Season: Fall to Spring

Habitat: Woodlands, bottomland, stream banks

Preparation: Pound fruit and inner shell/nut. Eat as-is, dry into cakes, or mix with flour.

Note: Also known as a "sugarberry" these relative of the elm are very common throughout the deep south and even in west Texas canyons. The drupes do not easily fall from their stems and often provide an excellent food source for both humans and wildlife both long before and after the more important acorn and pecan harvests.

Pecan *Carya illinoinensis*, **196 kcal/oz** (shelled)

Edible part/s: Nuts

Season: Fall to early winter

Habitat: Stream/river banks and drainage basins, common cultivar

Harvesting: Nuts change from yellow/white to deep brown when ripe. Wind knocks down ripe nuts when green casings begin to open and dry. They can also be knocked down with a long pole. They can then be raked or picked up with special inexpensive or homemade tools.

Preparation: Leave in shell and store in cool dry place for up to a year. Nuts crack and separate from shell more easily when thoroughly dry. May be ground and added to acorn or mesquite flour.

100 lbs of pecans collected from 2 trees in 8 hours.

Note: The pecan is the ultimate Super Food, more densely packed with calories than almost any other wild, and even many modern foods. During pecan season, Native Texans devoted all of their time and efforts to collecting them, and the modern forager should do the same. Selling pecans can also be a fantastic source of income—in the shell, they fetch $1 to $3 per pound, shelled from $5 to $10!

Tools

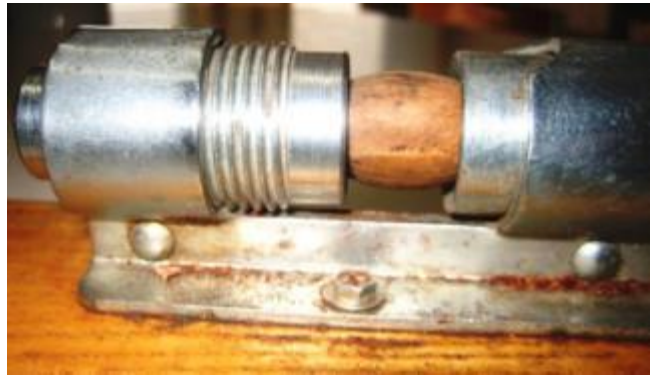
Beater: Used to knock agaritas, mesquite, pecans, acorns, walnuts and hackberries loose from trees/bushes. Can be as simple as a stick one finds on the ground, or a massive 30 – 40 foot monster construction. I make my long beaters by lashing or duct taping together dozens of thin bamboo poles, which are extremely strong but also lightweight. I might have four overlapping with 3, then 2, then 1 so that it is manageable and not top heavy. I anchor the base on the ground or my belt, and whip the tip back and forth to knock loose nuts. A stiff pole would be better, but would also be much heavier and dangerous.

Picker-Upper: These ingenious little contraptions are real back-savers when it comes to collecting pecans and other nuts! They can be purchased cheaply or easily made. Some designs are hinged so that the pecans stored in the reservoir can be easily emptied.

Left: *heavy bamboo beater. This thing was so heavy and unwieldy that we had to use two backstays held by helpers to keep it under control!* ***Right:*** *light-weight beater made from thin bamboo—easily controlled by one person.*

Below: *Picker-Uppers*

CRACKER. If you plan on cracking a lot of nuts, this little device is a must-have. It has a screw adjustment to handle every size of nut and uniformly cracks the nut with a lever-operated plunger. More expensive electric crackers operate much faster and would be a good investment if you plan on selling pecans, as this will double or triple the selling price.



Mortar These are some of the oldest tools in the world--holes ground deep into bedrock are enduring archaeological features, and are even made and utilized by enterprising chimpanzees and capuchin monkeys! In Texas, they were used predominantly for mesquite processing. A good mesquite mortar should be deep to prevent fragments from flying out, and narrow to concentrate the force of the pestle or pounder. They can be made by chopping or slowly burning out large hardwood logs or drilling/chiseling into limestone. The pestle is often 3 to 5 feet long, and is given a twist at the same time as it strikes the mortar.

Left: *my portable limestone mortar with live oak pestle****. Right:*** *A heavy wooden mortar that is perfectly suited for mesquite processing.*

Deep prehistoric bedrock mortars ground into the limestone banks of the Pecos River.

Hammer Mills While simple food processors and mills can handle many foods, mesquite seeds can only be easily crushed with expensive modern hammer mills commonly used to produce feed pellets for livestock. These consist of rotating plate(s) to which are attached pivoting weighted arms.

OTHER simple tools that will be needed for plant processing include large baskets or sheets for beating berries into, small shovels or digging sticks, axes, machetes or heavy knives for removing hearts, and sieves for flour making. It is also a good idea to have a small fish scale for weighing pecans.

The Earth Oven

This is one of the oldest and most efficient methods of cooking in the world. Steaming for prolonged periods of time breaks down toxic or indigestible compounds in plants, neutralizes bacteria and viruses, and makes the toughest meat and plant foods incredibly tender. While there are a number of ways to go about doing it, I use several variations on the agave and barbacoa pit.

The English word "barbecue" or bar-b-q, and Spanish "barbacoa" all derive from a Caribbean word referring to cooking meat in a pit. In south Texas and Northern Mexico, barbacoa refers to shredded steamed meat, traditionally cooked in a pit, and typically either whole young goat (cabrito) or cabeza (cow head). My family used to make cabeza in pits and my grandfather described the process to me—now I carry on the family tradition, but also have added my own items to the menu—agave, sotol, potatoes, sheep, deer and javelina.

The idea is simple: rocks are placed on top of a pile of firewood in a hole (heat rises, and having the fire in the hole will also heat up the earth). The rocks absorb the heat through radiation and convection, obtaining temperatures around 900 degrees F. When the wood has burned down to ash and the rocks have dropped to the bottom of the pit, the wrapped food is placed on the hot rocks, everything is covered with a foot or more

of soil and left to cook. The dirt traps and insulates the heat and the temperature within the pit stays at constant boiling point for up to five days.

Pit Preparation

Excavate a circular hole 2 feet in diameter or larger. I use a minimum of 3 feet for sotol and agave hearts. The hole should be 1.5 to 2 feet deep. My barbacoa pits have steep walls, while those for agave are more bowl-shaped.

Bowl-shaped sotol pit in west Texas, 4 to 5 ft. dia

My first barbacoa pit, which has been used over 30 times. Approx. 2.5 ft wide and 3 ft. deep.

Place a lot of tender and small branches in the bottom. Fill the pit with several hundred pounds of dry wood (mesquite and oak are best) using branches that are no more than 2 inches or so in diameter. Leave a small opening into the firelay on the windward side so the fire can be lit from beneath. You don't need a fancy firelay, and especially try to avoid a "tepee" shape. I just throw the wood on randomly, then insert more sticks into the spaces, and finally might lean more up against the side. The pile of wood should protrude several feet above the ground.

Next, gather dense limestone rocks from dry areas. The rocks should be flat, a minimum of 6 inches thick and about 8 inches in diameter. Smaller rocks will heat up quicker, but they will not hold as much heat or stay hot as long. I use smaller rocks for cooking meat and larger ones for sotol (24 vs. 72 hours) Avoid wet stones and chert, as both can violently explode. Seat the stones atop the wood. Get enough stones to cover the top of the woodpile, then toss a few more on for good measure. (This is why you do not want the woodpile in a cone shape—the rocks will just fall off).

Light the fire and get back—if you have done everything right, it will burn with little smoke, indicating extreme heat. The rocks will turn black as they are covered with soot, then to grey/white/pink as they become super hot and burn the soot off. When they reach this color, they are ready. Use a shovel to arrange the hot rocks into a flat or bowl-shaped cooking surface. It will take one to several hours for the wood to burn down and rocks to heat up, and during this time you can gather and prepare the rest of the materials

Plant Cooking

Gather several bucketfuls of large, mature, thick succulent prickly pear pads. The sotol/agave hearts and onions bulbs should already have been gathered and prepared (see above). You will need the leaves you have cut off, so pile them near the pit.

Throw enough prickly pear pads on the hot rocks to shield the hearts from burning. Place the hearts on the pads dump the rest of the pads over the

hearts. Place the cut leaves on top, and cover everything dirt as quickly as possible to trap the steam and heat.

If the hole is not deep, continue piling the dirt until it is over a foot thick and resembles a small volcano. Pull out any leaves that might be protruding—they can burn, creating a space for steam to escape and air to enter, possibly allowing the hearts to burn.

Return to the pit after a few hours and check for hot spots. Cover with more dirt until you feel nothing.

If there is a possibility of rain, cover the mound with a tarp. 3 to 4 days later, dig up the hearts. If you have put enough wet, green material in, it is almost impossible to overcook them. I have found that the longer I leave them in, providing the initial fire was hot enough, the juicer, more tender and sweeter they become. If done, the hearts will change from green/white to dark yellow. If they are a deep brown/amber color, they will have caramelized and be extra sweet!

To eat sotol, pull away the leaves, fold in half lengthwise and chew the base and middle, sucking out the juice and pulp and spitting out the fiber like sugarcane. The very center of the heart is like sweet potato and can be eaten whole.

Meat Cooking

To cook animal whole, I remove head, front and hind legs and insert them into the chest cavity to make a more compact cooking package. Next, wrap the body or head with aluminum foil, **OR** place in aluminum cooking pan and cover with foil **OR** wrap in wet burlap sack, **OR** use prickly pear in a way similar to cooking sotol, but singe off spines first. Alternatively, the animals fur, feathers, scales or spines (such as with porcupines) may first be burned off in a hot flame, and then the animal may be cooked intact using its own skin as the covering.

Arrange the stones to form a level cooking surface. If using burlap casing, you can place a sheet of thin metal over the rocks, place the meat on this, and place another sheet of metal over the top, like a lid. It helps to leave some kind of air space between packages (place chunks of charcoal, prickly pear, grass or other plant material between them) so that the steam can circulate around and cook everything evenly. Cover with dirt (even if you use a metal lid, cover that with dirt too to insulate)—you can't use too much! Meat can be removed in as little as 4 hours, but it will be MUCH more tender if left in overnight or even 24 hours.

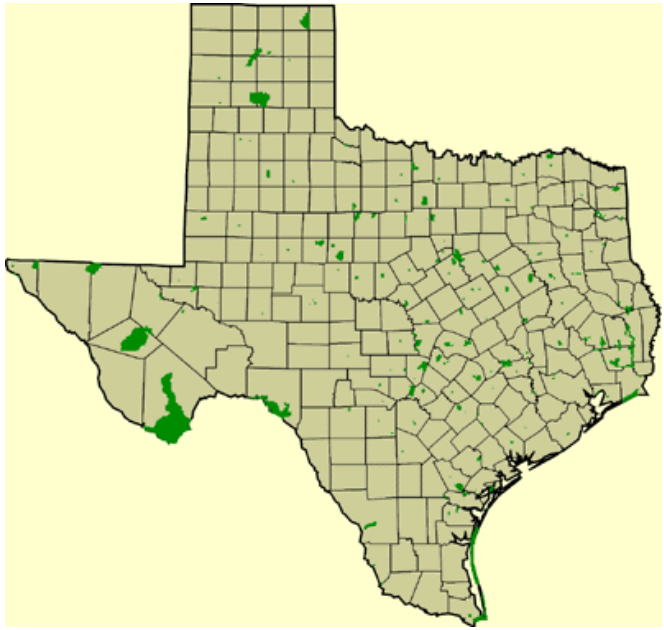
Dig down carefully so as not to puncture the foil—if properly constructed, the dirt close to the packages should be almost too hot to touch and steam should pour from the pit.

Carefully remove packages with gloves or a shovel and open—the meat should fall from the bone with the slightest touch!

After use, fire-cracked rock (which has become too small to hold heat) is discarded in all directions away from the pit, forming large rings and discs. Over time, the central hole and surrounding soil will erode away, leaving a ring of stones surrounding the last cooking elements left in the center. These are one of the key archaeological features of Texas—often the only enduring evidence left behind by peoples who worked with wood and bone. They can be seen from the air, and sometimes dozens can be found just a few yards from each other.

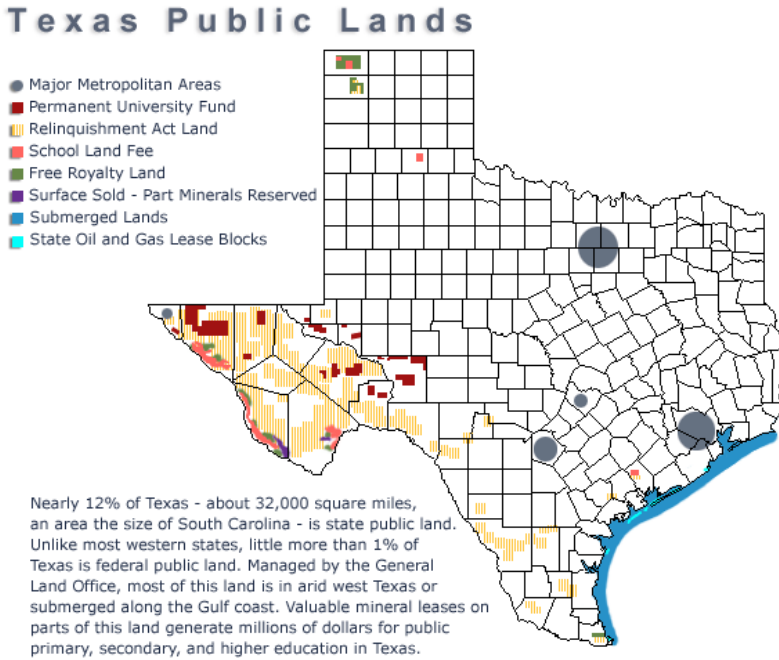
Public Foraging & Camping Lands

Unfortunately for the subsistence hunter, the vast majority of Texas land is privately owned (over 85%) So unless you have friends or family who own large ranches, it can be a challenge to find land on which to hunt and forage

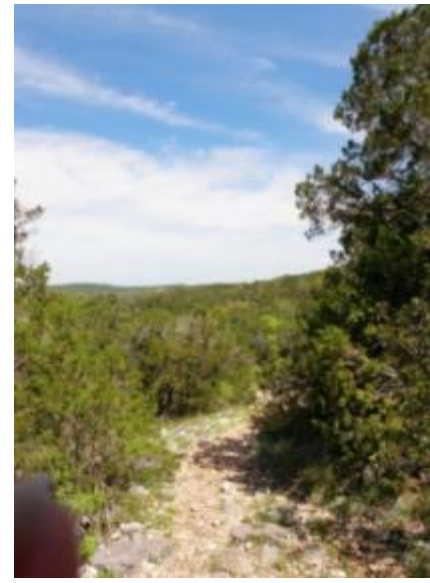


GLO

The General Land Office is Texas' equivalent of the BLM, the federal agency that manages vast tracks of land in western states that are mostly open to public use. However, the GLO manages its "public" land to fund the Texas public school and university system, and most lands are only open via **lease** for designated activities—primarily exploration and extraction by oil, gas and mineral companies and to a more limited extant, grazing of livestock, timber harvesting, and hunting. Most of these lands are in the Chihuahuan Desert of west Texas, so would be of limited use for subsistence anyway. However the GLO also manages the Laguna Madre and spoil islands, which are generally open to the public for fishing, hunting waterfowl and camping.


Texas Public Lands
Major Metropolitan Areas
Permanent University Fund
Relinquishment Act Land
School Land Fee
Free Royalty Land
Surface Sold - Part Minerals Reserved
Submerged Lands
State Oil and Gas Lease Blocks
Nearly 12% of Texas - about 32,000 square miles, an area the size of South Carolina - is state public land. Unlike most western states, little more than 1% of Texas is federal public land. Managed by the General Land Office, most of this land is in arid west Texas or submerged along the Gulf coast. Valuable mineral leases on parts of this land generate millions of dollars for public primary, secondary, and higher education in Texas.

State Parks



Most Texas state parks are highly restrictive—hunting is generally prohibited except for a few days a year when some parks close to the general public and open to a handful of hunters who have gained access via expensive drawn permits. Campers must pack in their own firewood or charcoal, fires are limited to existing grills or rings, and campers must stay in designated camping areas, even in the “backcountry.” Removing any vegetation is prohibited, but gathering of fruits, berries, and nuts for personal use is generally permitted or at least tolerated. The

upside is that camping permits are often inexpensive ($5 to $15 per day), and no fishing license is required if fishing with rod and reel from the bank.

State parks usually charge an additional entrance fee of around $5 per person for day use, although these fees are waived for everyone riding in a vehicle with someone who holds a State Park Pass which is good for one year from purchase.

Guadalupe River State Park, **1,938 acres.** 4 miles of river frontage, bass, suckers, bluegills, gar, pecan, walnut, persimmon

Government Canyon State Natural Area, **8,624 acres.** Persimmons

Choke Canyon State Park, 1,485 acres on 2 units on the 26,000 acre Choke Canyon Reservoir. South shore unit is day use only. Mesquite, Gar, bluegills, catfish,

Lake Corpus Christi State Park, **14,111 acres.** Mesquite, Bluegills, Catfish.

Enchanted Rock State Natural Area, **1643 acres.** Walnuts, Blugills and Catfish.

Mustang Island State Park, **3,474 acres.** Saltwater fish.

City Parks

Local parks usually do not allow hunting, but often offer superb opportunities for fishing and gathering mesquite beans, persimmons, pecans, and other fruits and nuts. Some of these parks are relatively large and have dozens of miles of hiking and biking trails.

There are hundreds of other smaller parks in San Antonio and other cities and towns, but the following are a few large parks in San Antonio that I frequently forage at:

McAllister: **986 acres** northeast of the San Antonio International Airport. Abundant mesquite, oak, yucca, persimmon and prickly pear.

Brackenridge: **343 acres** just north of downtown. Huge numbers of mature pecan and oak, some mesquite, yucca. Excellent fishing—shad can be caught downstream of the zoo where the river is more natural and flowing. South of Mulberry street the river is less heavily used, large numbers of armored catfish, bluegills, cichlids and bass

Olmos Basin: 1,010 acres just north of Brackenridge. Oak, Pecan present, superb mesquite harvests in past years.

Roadsides

Also referred to as **Public Rights-of-Way**, these provide the 2nd largest public foraging lands in Texas—over 80,000 miles. There are no state laws that prevent the gathering of plants on roadsides, but hunting and trapping is not allowed, except for the live-capture of reptiles:

*No person may hunt (capture, trap, take, or kill) any wild animal or wild bird on a public road or the right-of-way of a public road, **EXCEPT** that a person may capture indigenous reptiles and amphibians on the shoulder or unpaved right-of-way of a public roadway, provided that:*

- *the person possesses a valid Reptile and Amphibian Stamp,*
- *the person employs non-lethal means only to capture the reptiles or amphibians,*
- *the person does not possess a trap, and*
- *the person is visibly wearing at least 144 square inches of reflective material, both front and back.*

Note: The above laws do not apply to insects, which may be collected on public roadsides

Contrary to popular belief, it is **NOT** illegal to pick bluebonnets or any other **NON-threatened** plant from roadsides. It is however illegal to impede traffic or destroy public rights-of-way, such as by driving on them. To the best of my knowledge, there are no laws expressedly prohibiting camping, gathering firewood, or collecting plants on roadsides. Most of

these activities are permitted along the beaches and navigable streambeds (also legally public rights-of-way), so it would seem logical that the same laws would apply to roadsides.

Navigable Streambeds

In Texas, beds of navigable streams (any streambed, even when dry, that averages 30 feet wide between banks from the mouth up) like beaches, are legally considered public highways. At over 191,000 miles, rivers provide the greatest foraging opportunities of all.

Besides boating, persons may swim, float, walk, wade, picnic, camp, and (with a license) fish. Public use must be confined to the stream bed and, to a limited extent, the banks. Hunting is permitted in some situations. However, a hunter should always check first with local law enforcement officials because of numerous local restrictions and exceptions. A law called the Sportsman's Rights Act prohibits intentional interference with or disruption of lawful hunting or fishing.

Camping and fires are permitted on gravel/sand bars provided that there is no local ordinance forbidding it, and there are no limits as to how long one can remain on the river. Although trapping from boat is illegal, there are no prohibitions against trapping on shore below the riverbanks by foot.

Often, the biggest problem is finding access to these streams and river, as they are bordered by private property along much of the banks. However,

most can easily be accessed on foot via highway overpasses and bridges. Some even have paved or dirt roads leading down to them.

Dry washes, "Greenbelts" & Drainage Basins

***Cibolo Creek**, a popular unmarked rural stretch of usually dry creekbed that is popular with local horse riders, swimmers and adventurous teens. I*

trap, fish and forage here, and my brother (pictured here) sometimes explores along with me. Feral hogs and axis deer are also abundant.

Streambeds that are smaller than 30 feet in diameter are often owned by the City, County, or corporations (such as apartment complexes or golf courses). It is illegal to hunt or fish on **PRIVATE** land without written landowner permission on ones person. So, unless you have permission, you would be wise to limit your subsistence activities on questionable unmarked land to foraging. However, if one can determine that a tract of land is **PUBLICLY** owned, you may be able to legally hunt, trap, fish and gather there. Within developed areas, there are usually laws prohibiting the discharge of firearms and hunting of large game, but if an activity is legal for your backyard (perhaps live trapping possums or shooting squirrels with slingshots) chances are that it is legal in these areas. Every town is different though, and it's a good idea to check with local officials so that you do not find yourself in a pickle, or go about your foraging activities in such a way so as not to attract attention to yourself.

§ 30.05. CRIMINAL TRESPASS. *(a) A person commits an offense if he enters or remains on or in property, including an aircraft or other vehicle, of another without effective consent or he enters or remains in a building of another without effective consent* ***AND*** *he:*

- *had notice that the entry was forbidden; or*
- *received notice to depart but failed to do so.*

(b) For purposes of this section:

"Notice" means:

- *oral or written communication by the owner or someone with apparent authority to act for the owner;*
- *fencing or other enclosure obviously designed to exclude intruders or to contain livestock;*

- *a sign or signs posted on the property or at the entrance to the building, reasonably likely to come to the attention of intruders, indicating that entry is forbidden;*
- *the placement of identifying purple paint marks on trees or posts on the property*

The key here is the word **AND**. Provided that there are no features identifying the property as private, **AND** you have not been told to leave, you are not legally considered to be trespassing.

HOWEVER, it IS also illegal to hunt or fish on private land without written landowner permission on ones person. So, unless you have permission, you would be wise to limit your subsistence activities to foraging.

Parking lots

These often offer excellent opportunities to gather mesquite beans, acorns, pecans, loquats, persimmon, and other fruits. You may want to avoid gathering from the asphalt, as fruits may be contaminated by oil and other nasty chemicals. However, fruits still on the tree and those fallen on grassy or gravel islands should be safe to eat. I often gather in the lots of HEB and Walmart and have never been given any trouble.

Beach & Laguna Madre

My kayak jury-rigged to sail in the Laguna Madre between Port Aransas and North Padre Island

“Public beach" means any beach area, whether publicly or privately owned, extending inland from the line of mean

low tide to the line of vegetation bordering on the Gulf of Mexico to which the public has acquired the right of use or easement to or over the area by prescription, dedication, presumption, or has retained a right by virtue of continuous right in the public since time immemorial, as recognized in law and custom…

…the public, individually and collectively, shall have the free and unrestricted right of ingress and egress to and from the state-owned beaches bordering on the seaward shore of the Gulf of Mexico…

…It is an offense against the public policy of this state for any person to create, erect, or construct any obstruction, barrier, or restraint that will interfere with the free and unrestricted right of the public, individually and collectively, lawfully and legally to enter or to leave any public beach or to use any public beach…

Unfortunately, while our right to access beaches on foot is protected, local politicians have found ways around the law to profit off of and control the population. Certain stretches of beach within the jurisdiction of Corpus Christi and Port Aransas require "Parking Permits" in order to park a vehicle there for any length of time. In addition:

- *RV, tent and other types of camping ARE permitted on the beach.*
- *There is a three (3) night limit for camping during any three (3) week period*
- *Small fires no larger than 3 ft. x 3 ft. are permitted on the beach.*

Note: the 3-night limit applies only to specified sections, and often one needs only to move to a different mile marker to continue camping.

The beaches of South Padre Island do not require parking permits, although some stretches charge an entrance fee to vehicles. The northern end of the southern island is pretty secluded, and few people will bother you way out there. The Texas shoreline extends 367 miles, but this does not include the islands.

Padre Island National Seashore

Padre's claim to fame is that it is "The largest stretch of undeveloped barrier island in the world." At **130,000 acres** and 70 miles long, the Island provides incredible opportunities for aquatic foraging, camping, and REALLY getting off the beaten track—the whole seaward side is considered a highway, but south of the park headquarters there are no more roads or facilities of any kind. It is true wilderness all the way to the Mansfield Channel. Over the dunes, vast grasslands and cattail marshes stretch to the horizon. On the Laguna Madre side, prickly pear, small bushes and mesquite trees take at the base of the dunes. Wildlife abounds—coyotes, jackrabbits, deer, coon, rattlesnakes, ground squirrels and lizards (all of which are off-limits though).

Entrance fees (good for 7 days):

Vehicle: $10

Foot/bicycle: $5

Annual Pass: $20

Bird Island Basin Use Fee: $5 – Day, $10 – Annual, **Malaquite Campground**: $8 /day

Camping (with a free backcountry permit) is permitted at Bird Island Basin and along the seaward side of the island. Camping or driving in dunes and mudflats is not permitted. Make sure to bring enough water for your whole trip. The coyotes dig for freshwater "lenses" that float above the

saltwater layer behind the sand dunes. I've obtained freshwater this way, but it can be hit and miss and you don't want to be stuck in the searing heat and sun without water.

a 14 day camping limit is in effect at all camping areas. At the end of 14 days, campers must vacate their site and leave the park for a minimum of 48 hours before returning to camp.

My family has a special connection to Padre Island—it was named for my great-great-great… uncle Padre Nicolas Balli. His brother (and my great… grandfather), Juan Jose Balli each owned half of the island and used it for cattle ranching during the early 1800's. Another branch of my family, the Hinajosas, once owned much of what is now the King Ranch.

Wildlife Management Areas

Texas has a number of Wildlife Management Areas scattered throughout the state. Most are relatively small and restricted to such an extent that they are of little use to the subsistence hunter. Many permit only the hunting of game birds with shotguns for a few days or weeks per year, while others hold random drawings to permit handful of individuals in for paid hunts.

The only major benefit of interest for the forager holding an APHL (Annual Public Hunting Lands) Permit is the ability to camp free of charge for up to 14 consecutive days, and hunt rabbits and squirrels in certain areas. A Limited Public Use (LPU) Permit is less expensive but does not permit hunting.

The following 4 units (except for Sam Houston) are all within the range covered in this book. They are the most permissive of the WMA's allowing camping and small game hunting throughout much of the year.

Chaparral WMA, 15,200 acres. Near Artesia Wells, Generally, public hunts are scheduled from September through March. The Chaparral WMA is

open for non-consumptive use access during the period of April 1-August 31 with admittance through an access point located at the campground. Call the Area headquarters for further information.

Granger WMA, 10,888 acres. Surrounding Granger Lake, northeast of Austin. Game birds, hogs, and small game can be hunted almost year-round.

Matagorda Island WMA, 56,688 acres. 38 miles long. Sunday Beach area permits camping, beach combing, fishing, and bird watching. There are no fees, permits, or restrictions on the use of this beach. Access to the island is by private boat only. No APH permit is required for hunting waterfowl or fishing.

Sam Houston National Forest WMA

161,508 acres. There are several national forests in Texas, all in the east near the border with Arkansas and Louisiana. Even though not in the bioregion this book covers, I include it because it is the ONLY public land that truly allows subsistence activities to the fullest. These are truly deep, dark woods—pine, hickory and oak, with an understory of palmetto, bamboo, Korean oranges and other brush. Coyotes are everywhere, as are feral hogs, nutria and raccoon. The land is mostly flat and sandy, with low rolling hills and dozens of small streams and rivers.

Other than a hunting license and APHL Permit for hunting activities, no entry or camping permits are required and you can gather firewood, trap, hunt, camp almost wherever you want (except during deer season, Sept. 15-Feb 1) when you are required to stay in campgrounds or on designated roadsides (which really aren't too bad)) and you could actually camp there indefinitely provided you move camp every two weeks.

All hunters and those accompanying them must wear daylight fluorescent orange at any time when hunting, except when hunting fur-bearing or predatory animals at night or when hunting turkey or migratory birds. A minimum of 400 square inches of fluorescent orange must be visible (144 square inches on both the chest and back, and a daylight fluorescent orange cap or hat.)

Amistad NRA

57,292 acres. Amistad National Recreation Area is a forager's paradise, a reservoir at the confluence of the Rio Grande, Pecos, and Devil's Rivers with 547 miles of shoreline on the US side alone. The towering cliffs of the Pecos are riddled with thousands of caves and rock shelters, and hundreds of inlets and side canyons punctuate the shoreline. Here, one can experience extreme solitude. As there are few access points for vehicles and few trails, Amistad is best explored by boat—canoe, kayak, sailboat or motorboat. The upper reaches of the Rio Grande are very shallow and choked with submerged trees, and an airboat or kayak is recommended.

The 2011-2012 Hunting Season at Amistad National Recreation Area begins September 1, 2011 and ends February 26, 2012.

Five specific public hunting areas will be available for archery and shotgun hunting at Amistad National Recreation Area during the 2011-2012 hunting season. White-tailed deer, javelina, turkey, rabbit, exotic mouflon sheep, exotic aoudad sheep, exotic blackbuck antelope, and feral hog can be hunted with compound, recurve, and long bows. Dove, quail, duck, and

rabbit can be hunted with shotgun and birdshot. The use of rifles or handguns is prohibited at Amistad National Recreation Area

A Texas Public Hunting permit is not required, as Amistad is Federal land.

The park allows each family to gather one 5-gallon bucket of each of the following per year: Prickly Pear fruit, Agarita fruit, Persimmon fruit, Mesquite beans

Collecting dead and down wood for campfires is allowed. Campfires are allowed but must be contained in grills or on the ground in previously constructed fire rings. Backcountry camping from a boat is allowed (no permit or fee required) on all non-restricted shoreline. Camping is limited to 14 consecutive days, and a total of 60 days per year.

My brother and me at the confluence of the Pecos and Rio Grande

Other (Army Corp of Engineers Lakes, National Wildlife Refuges)

There are a number of other lands open to very limited hunting such as Balcones Cayonlands, Laguna Atascosa, Lower Rio Grande Valley and Anahuac National Wildlife Refuges. However these lands are of no real use to the subsistence hunter. Again, usually only a handful of paying individuals are randomly selected or allowed in on first-come, first serve basis for big game “pleasure” hunts a few days per year, or for waterfowl.

There are also several military bases that have hunting areas open only to Department of Defense ID holders.

A number of Army Corp of Engineer lakes also offer more extended hunting opportunities, but each has different permit requirements and regulations. The most permissive of these are located in northern and eastern Texas beyond the range of this book.

Base Camp

In order to conserve calories, time and money, it is very advantageous to establish temporary, centrally located base camps to store supplies, and process plants and game.

When out foraging, I carry the bare minimum of supplies:

- Pocket knife
- Hatchet or Machete
- .22 handgun or rifle
- Small backpack with roll of trotline, first aid kit, water bottle and water purifier (pump filter, straw filter or iodine tablets) and magnesium rod.

Location

After doing some scouting, try to place your camp at the center of a 3 to 5 mile foraging radius. This means you will be travelling on average 6 to 10 miles per day to reach your foraging areas and return. Obviously, if you have a boat, truck, jeep, bicycle, atv or dirtbike, this radius can be increased.

Try to avoid camping near slow-moving rivers, ponds, swamps, basins etc. in the summer, as the biting insects may be unbearable (not to mention the possibility of flooding) If you must camp near water, try to locate a very windy area, such as a ridge, clearing or beach. Large swarms of mosquitoes are particularly torturous at dawn or dusk during the summer near the dunes on the coast, but the almost constant wind near the shoreline keeps them at bay. Mosquitoes prefer dark, shady forests during the day, so also avoid these settings. When I was in Alaska, I camped on sandbars, but if I went into the forest during the day, I became a mosquito feast! Wear light long sleeve clothing if you must trek into mosquitoland. The mosquitoes were such a problem for the Karankawa and other coastal peoples that they would plaster their bodies with rancid shark and alligator grease!

Because I tend to sleep directly on the ground, I am also very careful to locate my camp away from possible fire ant, scorpion and spider habitats (these are your real concerns when sleeping, not snakes!). An open, level, elevated dry area away from crevices, leaf litter and brush usually does the trick. If you can't find such an area, lashing a few poles to tree trunks to form an elevated cot-like platform works. When I was younger I used to build chimpanzee-style sleeping platforms high the trees—weaving living branches into a large basket and padding it with grass and shredded bark!

Shelter

A good shelter should keep you and your supplies warm (or cool), dry and protect you from marauding hordes of insects. I have utilized a number of different shelters—from sleeping under the stars in West Texas to a homemade wall tent in East Texas. Your shelter will be determined by your environment—a small shelter is much easier to keep warm.

Throughout most of the year in Central Texas, you will be spending very little time in your shelter, as it rarely rains or gets cold. The shelter is primarily for protection from insects, wind, sun and insurance just in case it does rain.

Tents & Tarps

I strongly dislike most synthetic commercial tents, as they are often unbearably hot and stuffy during the day, and become wet and soggy when water condenses on their walls at night. They also tend to be very flimsy and prone to rapid wear and tear. If you go with a commercial tent, a small heavy-duty military-style canvas tent with plenty of large-screen covered openings would be a good investment. Although heavy, they will last a long time, withstand storms and provide more headroom.

My trapping camp near Kelly's Pond, Sam Houston National Forest

Below freezing outside, my little popcorn-can furnace kept my shelter around 80 degrees. It was a real luxury to be able to get dry and warm after the long days of slogging through wet East Texas brush.

My rudimentary tarp shelter on the Chena River, Alaska. Note the mosquito net

I always carry one or more sturdy plastic tarps. They are cheap, waterproof, lightweight and compact. A good tarp should have reinforced edges with grommets for lashings. I prefer to make my own shelters by securely lashing flexible, smooth saplings together in a dome shape, covering with tarps, and leaving plenty of large openings for circulation, which I cover with mosquito netting during the summer and breathable fabric sheets during the winter. During the winter, I keep the shelter as small as possible so that it can be easily warmed by body heat or a small stove.

Tarp shelter deep in the Lacandon Jungle, Chiapas Mexico

When it's warm, I often just run a tight rope between two trees and either tie one edge of the tarp to this or fold the tarp over it in an "A" shape, securely staking the edges into the ground or tying to large rocks or logs.

I often sleep directly on the ground. To insulate my body from the cold in winter and provide a little padding for my bones, I break up the soil or pad my sleeping area with grass and leaves covered with deer skin. I've also used a small foam pad.

During our second day in the Frank Church Wilderness, my friend Joshua and I reached the top of a high mountain ridge. With the sun setting and clear blue skies, we threw up a quick lean-to from sticks and passed out. That night, a huge thunderstorm blew in—trees were snapping all around us and we were getting soaked. I unzipped my sleeping bag and threw it over the lean-to. We stayed mostly dry through the rest of the storm, but learned a valuable lesson—never push yourself and always leave plenty of time to build an adequate shelter before nightfall because you just never know.

Rock Shelters

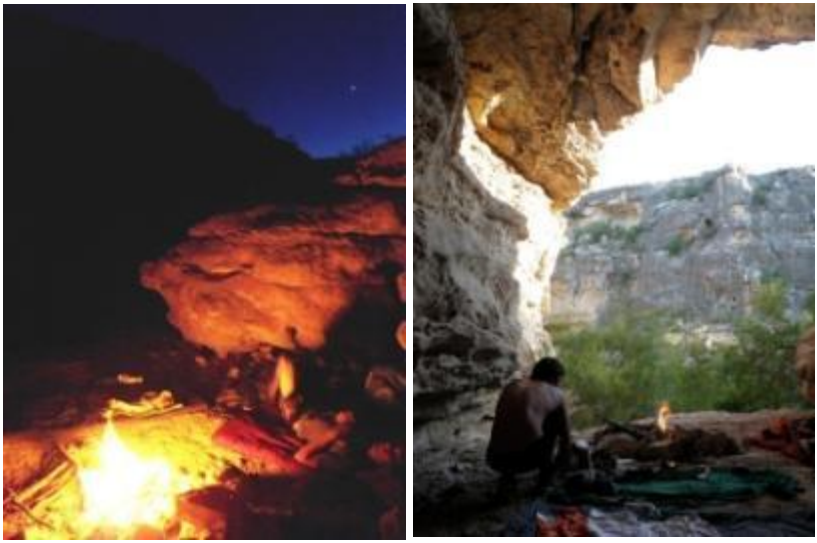
Contrary to popular belief, "cavemen" usually did not live deep in caves, but rather at their entrances, or even more commonly, in "rock shelters" –shallow depressions and overhanging rock features eroded out by wind and water.

Rock shelters can be easily found from the Hill Country west to New Mexico. These often offer superb comfort—cool and shaded during the day and easily warmed at night by fire and simple stone reflectors.

To locate a rock shelter, look above the bends of rivers or canyons. They are often hidden from view by luscious green plant growth that develops from water dripping from the roof edge. During the summer, north facing shelters are moist and cool—naturally air conditioned! During the winter, south-facing shelters act like parabolic reflectors—quite comfortable even

when the weather is freezing! In addition, the rock absorbs the heat and will stay warm for a while even after the sun sets.

My friend Joshua at our camp in a rock shelter in Lincoln National Forest, New Mexico



Camped in a rock shelter on the Pecos River

Avoid rock shelters that have fractures in their ceilings or crumbling walls. While unlikely, the last thing you want is to be crushed by a falling boulder in your sleep! Also, many rock shelters are “habitation sites” that were occupied by prehistoric peoples. It is very important to avoid disturbing these sites, which are a gold-mine of archaeological information about foraging lifeways. An artifact out of context has no meaning, and disruption of sites by commercial collectors and careless campers has resulted in enormous loss of knowledge. In addition, rock shelters showing signs of prehistoric occupation (middens) on public land are often legally off-limits for camping.

Modern Options

Other good mobile shelters (providing you can afford them) include small trailers and RV’s, pop-up campers, slide-in campers, modified vans/trucks and sailboats with small cabins. Boats can be particularly versatile, as many prime foraging areas in Texas are along the coasts, rivers and reservoirs, cannot be accessed by roads and often not even on foot. In addition, for those preferring a more conventional lifestyle these often provide electricity, refrigeration and air conditioning through the use of generators or engine.

You may also want to consider purchasing a small plot (under an acre) of cheap rural land near the coast, national forest, river or lake. Even if you do not choose to build a cabin or other structure, you will have a private area to camp year-round, store supplies, cook and relax without having to worry as much about regulations on public lands, while at the same time being a few minutes away from vast public foraging areas.

Water

Finding adequate drinking water can be a big concern in much of Texas. If you are foraging by automobile or sailboat, it’s a good idea to just pack it out with you. You will need at least half a gallon per day, more than a gallon if active during 100+ degree dry windy weather.

The biggest concern with water from natural sources is that it be free of bacteria and other pathogenic microorganisms. Drinking untreated water

can cause serious illness or even death. I contracted a mild case of giardia, also known as “Beaver Fever” when drinking only untreated stream water in Idaho and Montana for three weeks. Believe me, its not fun and is pretty scary. While it is possible for your body to build up resistance to over time (many hunter-gatherers drink untreated water from muddy sources that would make the average civilized person vomit on the spot) it’s a good idea to treat all questionable water. Even hunter-gatherers sometimes had cases of intestinal worms, although diet and various herbal medicines often prevented or eliminated them. In addition, with domesticated livestock, herbicides, pesticides, fertilizer and other industrial sludge, we have problems that prehistoric folks didn’t have to worry about.

Springs

Water bubbling up from the ground is often safe to drink without treatment. Perennial (continuously flowing) springs are sometimes marked on good topo maps. They can also be found at the base of cliffs, mountains, fault lines and canyon bottoms. When rainwater penetrates permeable ground (such as limestone) it sometimes reaches an impermeable layer where it pools. It flows through fissures in the rock until it emerges somewhere lower, sometimes gushing out under great pressure, sometimes just dripping or oozing up into small pools. Either way, there should be evidence of flow. All stagnant water should be treated. Much of the drinking water in the Hill Country comes from the Edwards Aquifer—my family has drunk untreated, unfiltered well water for years and I think it’s the best water I’ve had anywhere.

Rainwater

Rain in Texas is often unpredictable and unreliable, but when it does rain, large quantities of relatively good drinking water can be easily collected by placing a bucket under a sloping tarp. I collected several gallons a day this way in East Texas to supplement boiled pond water.

One hot summer I did something incredibly stupid in retrospect. I wanted to test myself to the limit, and hiked up to the very top of the Chisos Mountains, then down into the desert, around the entire southern edge, and back to the top. I had several energy bars, but no shelter, and no water. 3 days, 30 miles and I didn't see another human. At times the "trail" vanished for miles. The whole experience was surreal—I felt utterly helpless, insignificant and euphoric at the same time alone in such a vast landscape at the mercy of nature.

Before heading out, I had marked a number of spring locations on a topo map and hoped they would be flowing! Fortunately, they all were. Had a single spring have been dry, I would have become severely dehydrated and could have easily died out there. Lesson: ALWAYS carry water!

Seep Wells

Lush vegetation, such as bright green grass, cattails, or chufas in an otherwise dry area indicates water just below the surface. As you dig deeper, you should feel the soil getting damper. Sometimes you may have to dig as much as 3 feet, but you'll know when you hit water! Keep digging a little more after you hit water, then allow the dirt or sand particles to settle for a few minutes. With this little well, you can have a relatively good source of water that may last for days or weeks. Treatment is still recommended. Seep wells can often be dug several yards away from stagnant ponds or questionable rivers to provide a somewhat safer source of emergency drinking water.

Near the coast, similar small wells can be dug behind or at the base of the first dune. I first discovered this method when I followed a number of

coyote and deer trails converging on a (presumably) coyote-dug well on Padre Island. Looking in similar areas, I dug my own well and hit freshwater! The reason this works is because freshwater is less dense than saltwater and forms a floating “lens” within the sand. The trick is not digging too deep--stop when water begins to seep into the hole. My holes have typically been about the length of my outstretched arm, and I use a long piece of tubing to suck the water out.

Solar Stills

The plans for the typical solar still common in survival manuals produce very little water—essentially just enough to stave off dehydration in emergency situations. However, several larger versions can be built and are being commercially manufactured to provide supplemental drinking water in “3rd World” countries and for maritime survival kits. Even these though require a whole day in full sun to provide enough drinking water for one person.

Treatment

The cheapest way to treat water is by bringing it to a rolling boil, although this can be time and fuel-consuming. I pour water through a cloth over a pot to filter out large debris and use thin-walled metal pots and a very hot fire fueled with lots of small twigs to speed up the process. Filtering through “activated charcoal” (fresh campfire charcoal will work) will help to remove unpleasant odors and tastes.

Commercially available hand- pumped filters have become cheaper and are pretty effective at removing most microorganisms. If you plan on obtaining a lot of water from natural sources for any length of time, these are the way to go. I’ve even used one that incorporated a filter into a straw so that I could drink directly from streams and rivers! While out foraging, it’s a good idea to carry one of these to cut down on weight.

Iodine tablets are also effective for treating water—they often come with neutralizer tablets that are put in the water after about 30 minutes of treatment to restore the taste and color. However, continuous use of

iodine tablets can cause health problems, and they are best used only occasionally or as an emergency backup.

Basic Supplies

- **Hardware** (I have several small pocket knives, X-Acto razors, a jungle bowie, short fixed-blade skinning knives, a hatchet, axe for splitting wood and machete with saw on upper edge. A pickaxe, full-size shovel, pliers and wire cutters are also good to have around camp)
- **Sharpeners** (A dull knife is dangerous. I sharpen my knives with steel rods, carbide, ceramic and whetstones. I use a file for axes and machetes)
- **Rope** (a few hundred feet of cheap stuff often comes in handy)
- **String** (paracord or trotline, by FAR the most important resource)
- **Backpack** (Small daypack and frame pack. I use a tumpline, which rests on the forehead to carry much heavier loads without any stress on the shoulders. I often make my own frames by lashing poles into an "A" shape.)
- **Cooking Pots** (should be large and lightweight)
- **Frying Pan**
- **Small Grill**
- **Plastic Bottles/Jugs**
- **Duct Tape** (second to string as most useful invention ever)
- **JB Weld** (Epoxy Glue)
- **Gun Cleaning Kit** (oil, solvent, rods, brushes, patches)
- **Maps** (USGS free topo downloads and homemade maps from Google Terrain. I print them on multiple sheets of paper, tape together and laminate with clear contact paper)
- **Small Cooler** (use with dry ice)
- **Buckets**
- **Hammock** (Made from parachute material, rolls up into pocket-sized ball)
- **Surplus Combat Clothing** (large numerous pockets often allow me to leave behind the backpack. They are also very sturdy)

- **Rain Ponchos**
- **Survival Blanket**: (Also called “space blanket” these pocket-sized reflective-coated plastic sheets can be life-savers)
- **“Survival Kit”** (small tin with razor blade, fish hooks, water-proof matches, fishing line, trotline, duct tape and iodine tablets)
- **Sewing Kit** (various needles, scissors, thread, and dental floss)
- **First Aid Kit** (finger splint, medical tape, bandages, disinfectant pads, antibiotics, gauze, butterfly sutures, tweezers, surgical scissors, scalpel, clotting agents, ibuprofen, electrolytes)
- **Magnesium Rod Fire Starter**
- **Disposable Gloves**
- **Biodegradable Soap**

As you get older or other family members and friends join you, you may have the desire to live a less austere existence. I don’t have any problem with using technology, but I often go minimalist just to keep the weight down. The more stuff you have, the harder it is to move quickly and the more costly it is in both time and money to maintain everything. Just ask yourself if you are using the technology as a tool, or if its using you and you could do without it quite comfortably! I have found the following technology to be useful:

- **Kerosene lamps**
- **Hand-cranked flashlights**
- **Solar radio, lamps & phone charger**
- **Motorized Bicycle** (48cc 2-stroke engine mounted on mountain bike, 80 to 100 mpg, legal, no insurance required)
- **Mytrails Phone App** (downloads terrain maps for offline use—turns phone into GPS for use beyond cell signal range)

Above: *Hiking through Michoacán, Mexico with homemade tumpline pack*

Heart of the Hunter

"Some people in his situation could have figured out a way to walk out or winter over... but to do that you'd have to be a tiger, a killer, an animal."
-- **Into The Wild**

"One of the many baffling mysteries concerns who survives and who doesn't... The category that has one of the highest survival rates is children six and under... they have a deep secret that trumps knowledge and experience… they follow their instincts."
--**Deep Survival, Laurence Gonzales**

My youngest students are consistently the most open-minded and enthusiastic about unusual foods and techniques. Kids under 6 years old dig right in gutting javelinas, scavenging old deer carcasses and chowing down on grasshoppers with relish.

I first read the story of Christopher McCandless (Into The Wild) when I was 18. I think about that story every time I go into the deep wilderness. An idealistic romantic, he survived for several months in Alaska with nothing more than a bag of rice and a .22 rifle. After bringing down a moose, he was overcome by sadness and guilt after watching all the meat rot due to not knowing how to properly preserve it. He decided it was time to head back to civilization, but was blocked by a raging river swollen by melting ice. If he had a decent map, he would have known that there was a crossing about a mile away. Instead, he walked back, lay down and starved to death after several weeks of eating questionable seeds.

He made several mistakes. He went alone, did not know the terrain and did not know how to dry meat. But plenty of adventurous folks have gone

alone to new lands with little knowledge, tested their will and survived. What was the difference? -- Attitude. He went to Alaska for the wrong reasons--he had no intention of staying. He sought a “spiritual” experience but was ignorant of nature’s brutal reality. Life in the wild is not about “harmony” or warm fuzzy New Age feelings popular today. Nature is a dynamic equilibrium, violently swinging from one extreme to the other. There is no room for sentimentality, introspection or self-doubt. It’s you or the bear. Some say: “I wouldn’t like it if the bear ate me, so I won’t eat the bear.” But no bear in its right mind would do the same for you! It’s just the way things are. You’ve got to keep trying, because the second you give up, you’re as good as dead. You shot a moose and it spoiled. Ok, you learned your lesson—now get over it, shoot another one and DO IT RIGHT! Young lions and other predators rarely get it right the first time either—experience and practice are required to fine-tune the predatory instinct.

If you *really* want to live off the land, you can’t be squeamish. You can’t get light-headed at the sight of blood. Today most of us are isolated from death, we fear it, we hate it, we don’t understand it because we only see it on TV, and then mostly simulated. Our meat comes in neat plastic packages. We do not see the animals killed or butchered—it’s almost taboo. Many go their whole lives and kill nothing bigger than an occasional roach. This would be unthinkable in a foraging society, where children dance atop dead whales and play with the guts of kangaroos.

I often hunt with a rifle because it’s a reliable way of getting meat. But I’ve killed animals in many other ways—with spears, clubs, knives, and my bare hands. The first time you might feel guilt, sadness, a churning stomach. I’ve killed thousands of animals since trapping my first mouse when I was 6. Sometimes when running a trapline I kill two or three animals in a morning. After a while, it won’t bother you at all anymore. You may feel something else entirely.

I don’t really understand the idea of hunting for “sport.” What I experience when killing up-close and personal goes way beyond the

“amusement” some might feel when dropping an unsuspecting groundhog from 100 yards with a high-powered rifle. It’s the closest thing to a “religious” experience that I’ve ever had. I feel transformed, no longer human; I have become a part of this world, no longer a hunter, but an animal, a predator. I feel the doe’s life flow into my hands as she stares deep into my eyes. She gives me her blood, her power. Every animal that I kill and eat becomes part of me, both literally and mentally.

Death is a necessary part of life. For every organism that lives, many others must die. You are alive right now only because of this, even if you do not recognize it.

Ultimately, foraging is a religion, it’s the ultimate religion. Not something you believe or say, but DO. If God made us, we honor Him by doing what we were made to do.

“Tracking is like dancing because your body is happy; you feel it in the dance. When you are tracking and dancing, you are talking with God. This is what we were born to do. <u>This</u> is the Great Dance.”

--!Nqate, San Hunter

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About the Author

Nathan Martinez is a subsistence hunter and experimental archaeologist. A direct descendant of Juan Jose Balli, brother of the more well known Padre Nicolas Balli, Nathan's interest in wilderness living was sparked at an early age by relatives' stories of using wild edible plants, hunting, and cooking meat in barbacoa pits. He spent part of two summers living with fishing tribes in the Canadian Pacific Northwest, worked at a world-class archaeological & foraging lifeways school in West Texas and was a consultant for Discovery Channel's "Man vs. Wild" and "I, Caveman." He has traveled from Alaska to the Amazon experimenting with the potential of different environments for long-term foraging. His current project is experimenting with living off the sea on a sailboat in the Laguna Madre, Gulf of Mexico and beyond.